WAREHOUSE OPTIMIZATION AND PERFORMANCE OF DISTRIBUTION FIRMS IN KENYA

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Warehouse Optimization and Performance of Distribution Firms in Kenya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University

Signature……..……. Date……

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This thesis has been submitted for examination with our approval as the University Supervisors

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DEDICATION

I dedicate this research Thesis to my beloved wife Faith Cherono and My children Kyle and Kimberly for the different roles they played in creating an environment conducive enough to enable me complete this research Thesis. Their encouragement, love, care and concern continuously inspired me in the achievement of this goal.

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DEFINITION OF OPERATIONAL TERMS

Distribution firm is a business entity that specializes in moving goods from producers or manufacturers to retailers, wholesalers, or final consumers. These firms act as intermediaries within the supply chain by storing, transporting, and delivering products, ensuring that goods are available at the right place, time, quantity, and condition (Gu, Goetschalckx, & McGinnis, 2022).

Firm Performance Refers to the ability of a company to achieve its objectives and goals, often measured by inventory Turnover Rate, order Fulfillment Accuracy and on-Time Delivery. It is a critical aspect of a firm's success, as it reflects the ability of the company to create value for its stakeholders, including investors, employees, customers, and society at large (Meiryani *et al*, 2020).

Firm Size Refers to the measure of a company's magnitude or scale, often in terms of its revenue, assets, market capitalization, number of employees, or market share. Firm size in this study was measured into small, medium, and large distribution firms. Small falls in the category of 0-49 employees, medium falls in the category of 50-249 employees and large is above 500 employees (Pila, Muturi & Olweny, 2022)

Product Placement It is a marketing technique where references to specific brands or products are incorporated into another work, such as a film or television program, with specific

promotional intent. Much of this is done by loaning products, especially when expensive items, such as vehicles, are involved (Aghbar & Al-Qaseem, 2024).

Retrieval Systems They are a variation of computer-controlled systems that automatically place and retrieve loads from set storage locations in a facility with precision, accuracy, and speed. An automated storage and retrieval system (ASRS or AS/RS) consists of a variety of computer-controlled systems for automatically placing and retrieving loads from defined storage locations (Gercina & Maria, 2021).

Warehouse Flow It refers to a visual chart or diagram that shows the main activities of the warehouse. It is a subcomponent of warehouse organization. A process flow illustrates how goods are received, the process they go through, how they are shipped, and any stages in between. A warehouse system flow chart illustrates the movement of warehouse goods in a visual format (Shale, 2024).

Warehouse Layout It is the planned design of a warehouse to streamline overall operations. The right layout should help to improve the flow of production and distribution. A good warehouse layout should improve the flow of the facility. But there are many more things a warehouse layout can do to enhance the way you operate (Mohamud, *et al*, 2023).

Warehouse Optimization	It refers to the systematic process of improving the efficiency, productivity, and overall performance of warehouse operations. It involves analyzing and refining various aspects of warehouse management to maximize resource utilization, minimize waste, and enhance overall operational effectiveness. This study measures warehouse optimization in terms of product placement, warehouse flow, retrieval systems, and warehouse layout (Saifudin, Zainuddin & Azwardi, 2023).

ABBREVIATIONS AND ACRONYMS

3PLs	Third-Party Logistics Providers
ANOVA	Analysis of variance
ASRS	Automated storage and retrieval systems
EFA	Exploratory Factor Analysis
FMCG	Fast Moving Consumer Goods
ICT	Information Communication Technology
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KENGEN	Kenya Electricity Generating Company Limited
LAN	Local Area Network
MIS	Management Information System
MRP	Materials Requirements Planning
NACOSTI	National Commission for Science, Technology, and Innovation
NSE	Nairobi Securities Exchange
OLS	Ordinary Least Square
PCA	Principal Component Analysis
ROA	Return on Assets
SBS/RS	Shuttle-Based Storage/Retrieval Systems
SC	Supply Chain

SCM	Supply Chain Management
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for the Social Sciences
SRM	Storage and Retrieval Machine
TAM	Technology Acceptance Model
TIR	Thesaurus-Based Information Retrieval
TOC	Theory of Constraints
TOIR	Topic Maps-Based Ontology Information Retrieval
US	United States
VIF	Variance Inflation Factor
WMS	Warehouse Management Systems

ABSTRACT

In Kenya, 75% of warehouses run at a capacity of less than 40% due to poor designs and layout out what this means that Distribution Firms paying at-least 40% of your cost for free to the warehouse due to underutilized assets. This study therefore sought to establish the effect of warehouse optimization on performance of distribution firms in Kenya. Specifically, it sought to establish the effect of product placement on performance of distribution firms in Kenya, to assess the effect of warehouse flow on performance of distribution firms in Kenya, to determine the effect of retrieval systems on performance of distribution firms in Kenya, to find out the effect of warehouse layout on performance of distribution firms in Kenya and to assess the moderating effect of firm size on the relationship between warehouse optimization and performance of distribution firms in Kenya. This study was anchored on institutional theory, queuing theory, technology acceptance model, the theory of Constraints (TOC) and theory of the firm. This study used both descriptive and explanatory research designs. In addition, this study employed a positivist research philosophy. The target population was based on the total of 1061 registered distribution firms in Kenya spread all over the country. The overall sample size for this study was determined using a formula by Yamane formula. Therefore, using the Yamane formula, the sample size for the study was 290 distribution firms. This study also used questionnaire to collect data relevant to this study. Quantitative data collected was analyzed using descriptive statistical techniques which are frequencies, mean, standard deviation. Inferential statistics which include Pearson correlation and the Regression Analysis Model were used to test the relationship between study variables. To test moderating effect the study used hierarchical regression model. The significance of the model was tested at 5% level of significance. Data was analysed using Statistical Package for Social Sciences (SPSS) software. The study results were presented through use of tables and figures. The returned questionnaires for the pilot test were 15 (100%). From the descriptive analysis, the study found that respondents agreed on average that product placement, warehouse flow, retrieval systems and warehouse layout affects performance of distribution firms in Kenya. From the regression findings, the study found that a unit increase in product placement would result in a increase in performance of distribution firms in Kenya. A unit increase in warehouse flow would result in a 0.813 (p=0.000) increase in performance of distribution firms in Kenya. Also, a unit increase in retrieval systems would result in a 0.725 (p=0.000) increase in performance of distribution firms in Kenya. In addition, a unit increase in warehouse layout would result in a 0.732 (p=0.000) increase in performance of distribution firms in Kenya. Finally, the study found that introduction of firm size as moderating variable has positive influence on performance of distribution firms in Kenya; it led to .093 change in R Square. The study therefore recommends that distribution firms should give priority to product placement (Screen placement, script placement and plot placement),warehouse flow (dispatching, returns and order picking), retrieval systems (information system, input system and output system) and warehouse layout (distribution Center Layout, fulfilment Center Layout and cross-Docking Facility Layout).

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Warehouses are a key aspect of modern supply chains and play a vital role in the success, or failure, of Distribution Firms (Hompel & Schmidt, 2017). Warehousing operations optimization has been considered an effective and powerful approach to improve the performance or design more efficient warehouse. Therefore, management of warehouse operations is one of the important steps in global supply chain and the impact of the improvement of warehouse operations' yield is crucial for cost reduction and increase of productivity in a supply chain company (Chrisopher, 2021). Optimizing a warehouse creates conditions in which high-demand items in-demand are always stocked, leading to timely order fulfilment. Warehouse optimization is key to the efficient operation of warehouses of all sizes. A disciplined process, warehouse optimization includes automation and a determination of how to save time, space, and resources while reducing errors and improving flexibility, communication, management, and customer satisfaction. Other warehouse optimization considerations include warehouse flow, product placement, storage, and retrieval systems. Warehouse optimization is vital to lean warehouses and agile supply chains. The most efficient warehouses are those that have been optimized to beat the competition on every level.

Modern logistic warehouses and distributions centers are designed on the basis of dozens optimization research. In consequence of that, Warehouse Management Systems (WMS) become important. The WMSs which drive logistic warehouses and distribution centers are core elements of the material and goods flow in logistic chain. According to the Lai and Cheng (2019) the activities of the warehousing optimization can be divided into three groups. First, the basic technical structure of warehouse; second, the operational and organizational framework, to which a special attention is paid in this work; and third, the coordinating and controlling systems for warehouse operations. The main contribution of this paper is to show the current state-of-the-art in optimization in mentioned three groups of interest, and to help researchers with

orientation in logistic warehouse optimization problems to improve performance of their firm (Wayongah, 2019).

Many business organizations spend a lot of resources installing inventory management systems with the aim of minimizing their total operating costs, and enhance service delivery to customers. However, many audits done by other studies reveal that there is an increased level of discrepancies in the manner in which the warehouse management systems are harmonized in an organization. On a number of occasions, there are cases of misstatements and inaccurate and fraudulent records detected within the system. Many organizations have trouble resulting from operating losses and cash flow problems. Quite often, piles of obsolete stock are seen within the premises of these institutions, resulting in huge write offs eating into the bottom line of these institutions. Many a times, stock outs are also experienced resulting in high customer turnover and therefore low sales and poor service delivery to customers. warehouse management normally becomes reportable issues (condition) and is always raised in the management letters to many institutions where very little attention is given in the management of inventories as records are inadequate (Lizardo, 2019). The reason why companies should focus on warehouse optimization is simple – warehousing costs present significant share of companies' operational costs. They can account for around 22% off all costs for logistics (Richards, 2018). This thesis will focus on optimization of logistics processes mostly related to warehousing.

1.1.1 Warehouse Optimization

In the United States of America, according to the Aberdeen (2019), research on the improvement of warehouse and distribution center performance deduced that for many companies, improved warehouse and distribution center productivity remains a goal, not a reality. Although companies' top focus in warehouse improvement is cutting logistics costs, six out of ten respondents report that they have not been able to lower costs in the last two years. A majority of companies have also been unable to reduce customer order cycle times. However, a segment of companies have been able to reduce both costs and cycle times. These top performers are leveraging more technology, have better data visibility, and work harder at cross-training their staffs.

Across the board, companies that are above average warehouse performers in their industry classified as Best in Class companies have been much more likely than their peers to have significantly lowered their warehousing costs in the last twenty four months.

In China, warehouse optimization has been increasingly driven by automation and technology adoption. Studies indicate that Chinese logistics firms are adopting automated warehousing systems, including ASRS and robotics, to improve operational efficiency and reduce costs. Hao et al. (2020) found that factors such as firm size, technological readiness, and environmental pressures influence the adoption of intelligent warehousing systems. Similarly, research on green supply chain management shows that warehouse efficiency in China is positively correlated with layout design, inventory management, material flow, and environmentally sustainable practices (ScienceDirect, 2025). Case studies of unmanned warehouses, such as JD Logistics' "Asia One," demonstrate how automation reduces labor costs while increasing throughput and profitability (Chen, 2024). These findings underscore that Chinese warehouse optimization emphasizes both technological advancement and environmental sustainability.

In Pakistan, warehouse optimization focuses on lean principles to enhance operational performance and reduce waste. Shaikh, Asim, and Manzoor (2020) applied lean concepts to warehousing in the FMCG sector, emphasizing process streamlining and waste reduction. Abbas and Siddiqui (2025) further demonstrated that lean warehousing improves business performance, with warehouse operational efficiency and supply chain complexity mediating this effect. Case studies of local firms, such as Ismail Industries, reveal operational gaps in storage management, traceability, and warehouse management systems, highlighting the need for audits and process improvement strategies (Asad et al., 2021). Overall, Pakistani studies emphasize human-centered process improvements, lean techniques, and context-specific interventions as key drivers of warehouse optimization.

In South Korea, efficiency gains in warehousing are closely linked to scale, technological adoption, and strategic location. A study by the Korean Logistics Society

(2024) using Data Envelopment Analysis found that general warehousing firms achieve higher efficiency than specialized warehouses, with technological change being a major driver of productivity improvements. Lim and Park (2020) highlighted the importance of locational strategies and real estate considerations in warehouse optimization, as rent, accessibility, and transport costs significantly affect operational efficiency. Furthermore, the rapid growth of warehouse automation in South Korea, driven by e-commerce demand, same-day delivery requirements, labor shortages, and digitalization, has led firms to invest in AI, robotics, and ASRS technologies, which improve throughput, reduce labor dependency, and enhance cost efficiency (Ken Research, 2023). These findings illustrate that in South Korea, warehouse optimization combines operational, technological, and spatial strategies to enhance performance.

In United Kingdom, Sople (2022) warehousing network plays a major role in the success of the physical distribution of products. It is observed that the leading firms adopt and implement the different warehousing strategies such as capacity switching, hub networking, cobbling and outsourcing. Both the analytic and simulation models are proposed for improving warehouse design practices. Analytic models are usually design-oriented, explore many alternatives quickly to find solutions. On the other hand, simulation models are usually analysis oriented. They provide an assessment of a given design, but usually have limited capability for exploring the design space.

John and Bowen, (2022) indicates that in today's competitive environment, companies must operate at maximum efficiency and provide superior service to ensure profitability. Three factors has been found to affect efficiency and effectiveness of the warehouse operations with respect to fast moving consumer goods industry such as simplicity/complexity of the warehouse management systems, product slotting techniques and layout planning of the warehouse (Lakmal and Wickramarachchi, 2023). The organizations' ability to effectively manage the warehouse, reduce costs and fulfillment operations is critical to their success. It is pertinent to mention that the organizations face great challenges in managing warehouses. The role and importance of warehouses in American economy has been altered to great extent due to changes in the way of raw materials, intermediate goods, and finished products.

In Ghana, studies have highlighted that warehouse efficiency is strongly influenced by both inventory management and transportation performance. Appiah, Teye, and Asare (2020) found that firms operating in industrial hubs such as Tema achieve higher warehouse efficiency when inventory practices are effectively coordinated with transport operations. Another study by Afum, Agyabeng-Mensah, and colleagues emphasized the role of green warehousing in promoting supply chain sustainability and long-term economic performance. Although green warehousing may have short-term costs, its integration with sustainable supply chain practices can enhance operational efficiency and competitiveness in Ghanaian manufacturing and logistics firms.

In South Africa, warehouse optimization has focused on the adoption of lean principles and system integration. Swart (2021) demonstrated that implementing lean practices such as waste reduction and streamlined workflows in third-party logistics (3PL) warehouses improves efficiency, but challenges such as workforce resistance and process inertia can limit outcomes. Similarly, Mabotja (2020) highlighted that many South African manufacturing firms suffer from inadequate system integration, limited automation, and ineffective picking strategies. The study recommends interventions such as worker training, zone picking, and the adoption of integrated Warehouse Management Systems (WMS) to enhance warehouse performance and competitiveness.

In Nigeria, warehouse optimization has benefited significantly from Lean Six Sigma approaches. Adeodu, Maladzhi, and Kana-Kana Katumba (2023) applied the DMAIC methodology in a Nigerian 3PL company, increasing process cycle efficiency from approximately 40% to 70% by eliminating non-value-added activities. Other studies investigating indigenous shipping companies in South-West Nigeria have emphasized that technological adoption and process innovation in warehouses are crucial for improving cost and time efficiency. These findings highlight the strategic importance of operational improvements and process standardization in Nigerian warehouses.

In Egypt, research has demonstrated that lean tools and agile supply chain practices play a critical role in warehouse optimization. Mostafa and Essam (2024) applied 5S,

value stream mapping, and other lean methodologies in Egyptian warehouses, showing measurable improvements in cost reduction, workflow efficiency, and operational effectiveness. Additionally, studies in the agricultural food sector of Egypt have indicated that warehouse management is a central bottleneck affecting supply chain responsiveness. Improving warehousing operations is therefore essential for building agile and efficient supply chains capable of meeting dynamic market demands in Egypt.

In Nigeria, the size of industry, small, medium, and large scale, has a significant effect on both the numerical strength of staff and level of involvement in stock control of both raw material and the finished product. The type of inventory system in practice in any organization depends on many factors among which are economic stability of the place, infrastructural facilities available, transportation network and many more which are called constraints. For many companies the root cause of underproduction stoppages and high production cost could be easily traced to unscientific method of arriving at a general inventory policies and crucial inventory decisions. The situation is more acute in a developing country like Nigeria, where the practical application of operation research techniques in industry and business enterprise is in its infancy. Moreover, the bulk of raw material inventory and the finish goods inventory used by companies in developing countries have to be imported from the industrial nations of Europe, America and Asia, which gave rise to higher cost of procurement and higher uncertainty in the availability of such basic raw materials (Ogbo & Ann, 2024).

According to a study by Faber, *et al* , (2024): Warehousing takes up to between 2% and 5% of the cost of sales of a corporation and with today's highly competitive global business environment organizations are emphasizing on Return on Assets, and hence minimizing warehousing costs has become an important business issue. Many firms are automating their basic warehousing functions to achieve the increase in throughput rates or inventory turns required for their warehousing operations to be cost effective. It is necessary to allocate warehouse resources efficiently and effectively to enhance the productivity and reduce the operation costs of the warehouse. One vital area determining the efficiency of warehouse is the determination of the proper storage locations for potentially thousands of products in a warehouse. Various factors

affecting the storage assignment like order picking method, size and layout of the storage system, material handling system, product characteristics, demand trends, turnover rates and space requirements are been extensively studied. It has been suggested that selecting appropriate storage assignment policies (i.e. random, dedicated or class-based) and routing methods (i.e. transversal, return or combined) with regards to above factors is a possible solution to improve the efficiency. Various decision support models and solution algorithms have also been established to solve warehouse operation planning problems (Poon, *et al*, 2019)

In Kenya, Warehouse management have been impacted by many business organizations spend a lot of resources installing warehouse management systems with the aim of minimizing their total operating costs, and enhance service delivery to customers. Many Institutions within East African Community have trouble resulting from operating losses and cash flow problems. Quite often, piles of obsolete stock are seen within the premises of these institutions, resulting in huge write offs eating into the bottom line of these institutions. Many a times, stock outs are also experienced resulting in high customer turnover and therefore low sales and poor service delivery to customers. Stock control normally becomes reportable issues (condition) and is always raised in the management letters to many institutions where very little attention is given in the management of inventories as records are inadequate thus the entire warehouse management system seems to have failed (Lizardo & Jaqob, 2019).

Kioko (2018) holds that the effective and efficient management of any organization requires that all its constituent elements operate effectively and efficiently as individual SBUs / facilities and together as an integrated whole corporate. Across the supply chains, warehousing is an important element of activity in the distribution of goods, from raw materials and work in progress through to finished products. It is integral part to the supply chain network within which it operates and as such its roles and objectives should synchronize with the objectives of the supply chain. It is not a ‘Standalone’ element of activity and it must not be a weak link in the whole supply chain network.

Due to global competition, organizations have been forced to improve their distribution. Instead of competing as individual entities they prefer competing as demand chains as it gives them an upper hand against their rivals through provision of high customer service levels by forging relationships with customers and suppliers while ensuring that ordering costs are minimized. Another strategic measure taken by distributors and manufacturers is the establishment of holistic cooperation between themselves and transportation organizations to facilitate effective communication, alignment of incentives and synchronization of decisions in order to enhance distribution service performance and gain competitive advantage in the global market (Venus, *et al.* 2019).

According to Rabinovich and Bailey, (2016), Distributon Service Quality comprises of an array of logistics that ranges from customer needs and marketing to delivery of finished products to customers. They claim that an effective physical distribution system is that which is reliable and ensures that products reach customers in a timely manner. Shan and Norm, 2017) resolved that the poor road network in Uganda has created more challenges in the transport and warehousing segment. They show that ineffectiveness of Distribution Service performance can be minimized or eliminated through vertical collaboration. This is where manufacturers and the distributors downstream collaborate for common good.

Nyakundi and Mutia (2025) found that layout optimization, inventory control, storage management, and material handling practices all significantly and positively influence supply chain performance. Their work emphasizes that optimizing physical warehouse structures and inventory processes is critical for agricultural firms' competitiveness and operational efficiency. In the food and beverage manufacturing sector, Njiru, Namusonge, and Thogori (2023) found that while many firms prioritize space optimization (e.g., maintaining aisle space) and enforce regulatory maintenance procedures, there is low adoption of automation or mechanization. The study suggests that strengthening policy frameworks could enable firms to invest more in technology to improve warehouse throughput and efficiency.

Kariuki (2024) found that the warehouse used random storage, mechanical equipment, and casual labor for optimization, and that random storage offered higher space utilization compared to dedicated or class-based storage systems. However, dedicated and class-based systems yielded higher labor productivity. The study thus highlights a trade-off between maximizing space and maximizing labor efficiency in Kenyan 3PL warehouses. In a more recent study, Karimi and Osoro (2024) looked at warehouse consolidation practices in horticultural exporting firms in Nakuru County, Kenya. Their regression analysis showed that practices such as cross-docking and better space utilization significantly improve firm performance. They recommend that horticultural exporters invest in flexible storage designs, structured picking systems, and possibly automation to boost efficiency.

1.1.2 Distribution Firms in Kenya

Distribution firms in Kenya play a pivotal role in linking manufacturers, wholesalers, and retailers to ensure that products reach the final consumer efficiently and in good condition. These firms operate across various sectors, including fast-moving consumer goods (FMCG), pharmaceuticals, agricultural produce, and industrial equipment. Their core activities typically involve procurement, warehousing, inventory management, order processing, transportation, and last-mile delivery. By managing the flow of goods across the supply chain, distribution firms reduce operational bottlenecks and enable manufacturers to focus on production while maintaining service quality to end customers (KNBS, 2024).

In Kenya, the operational efficiency of distribution firms is heavily influenced by their warehousing strategies, transportation networks, and information systems. Many firms employ centralized or hub-and-spoke distribution models to optimize stock levels, reduce delivery times, and lower operational costs. Studies indicate that firms that adopt modern warehouse management systems (WMS), automated inventory tracking, and integrated logistics solutions achieve higher efficiency, minimize stockouts, and improve customer satisfaction. Conversely, smaller firms often rely on manual systems, leading to challenges such as delayed deliveries, mismanaged inventory, and

high logistics costs, which can affect their competitiveness in the local market (KNBS, 2023).

Distribution firms in Kenya also face sector-specific challenges, including inadequate infrastructure, road congestion, fluctuating fuel prices, and regulatory compliance requirements. Additionally, the growth of e-commerce and changing consumer expectations for faster delivery have increased pressure on distribution firms to innovate and optimize their supply chains. As a result, firms are increasingly investing in technology, fleet management, and workforce training to enhance operational efficiency. The role of distribution firms is therefore critical not only in supporting industrial and retail sectors but also in promoting economic growth by facilitating trade, reducing supply chain inefficiencies, and ensuring products are delivered reliably across urban and rural markets (KNBS, 2024).

1.1.3 Performance of Distribution Firms in Kenya

The performance of distribution firms in Kenya is a critical determinant of supply chain efficiency and overall business competitiveness. Performance is generally assessed in terms of cost efficiency, service quality, delivery speed, order fulfillment accuracy, and customer satisfaction. Studies indicate that distribution firms that effectively integrate warehouse management, inventory control, and transportation logistics tend to achieve higher operational performance. For instance, firms employing modern warehouse management systems, automated stock tracking, and data-driven route planning are able to reduce lead times, minimize stockouts, and improve delivery reliability, thereby enhancing their market competitiveness.

In the Kenyan context, several internal and external factors influence the performance of distribution firms. Internally, factors such as workforce skills, technology adoption, operational processes, and management practices play a significant role. Firms with trained personnel, robust inventory management systems, and efficient material handling processes generally record higher productivity and lower operational costs. Externally, challenges such as poor road infrastructure, traffic congestion, fuel price volatility, and regulatory requirements can negatively impact performance. Additionally, the rapid growth of e-commerce and the demand for faster last-mile

delivery have necessitated innovative distribution strategies, including cross-docking, hub-and-spoke models, and adoption of digital platforms to track and manage deliveries in real time.

Empirical studies in Kenya further highlight that the performance of distribution firms has a direct link to organizational growth and customer satisfaction. For example, Karimi and Osoro (2024) found that horticultural exporting firms in Nakuru County that implemented warehouse consolidation and optimized delivery routes recorded improved operational efficiency and reduced distribution costs. Similarly, Nyakundi and Mutia (2024) showed that firms with effective inventory control and structured warehousing practices achieved higher service levels and lower lead times. These findings underscore that the performance of distribution firms in Kenya is contingent upon their ability to integrate technology, optimize logistics processes, and adapt to dynamic market demands, making efficient distribution a strategic priority for businesses operating in the country.

1.2 Statement of the Problem

The optimization of warehouse operations significantly impacts the performance and competitiveness of distribution firms in Kenya. However, empirical evidence suggests that many such firms face formidable challenges in achieving efficient warehouse management practices. According to a recent industry report by Frost and Sullivan ("Logistics Market in East Africa, forecast to 2025"), approximately 65% of distribution firms surveyed in Kenya reported difficulties in optimizing their warehouse operations effectively (Frost & Sullivan, 2021). These challenges manifest in various forms, including inadequate inventory management leading to excess stock levels or stockouts, inefficient space utilization, suboptimal picking and packing processes, and limited visibility into inventory movement. Furthermore, research indicates that distribution firms in Kenya with poorly optimized warehouses experience, on average, 20% higher logistics costs compared to those with efficient warehouse management systems (Olalere et al., 2020). These elevated costs not only reduce revenue growth but also hinder the ability of firms to invest in innovation, technology adoption, and market expansion efforts. Moreover, studies show that

distribution firms in Kenya with inefficient warehouse operations experience a 15% increase in order fulfillment lead times, resulting in diminished customer satisfaction and retention rates (Ndirangu & Karanja, 2019).

Therefore, performance of distribution logistics plays a crucial role in the overall success of an organization, as it directly impacts customer satisfaction and loyalty, which are vital assets for any business (Paulraj & Chen, 2023). In the context of logistical supply chains, the speed of operations, particularly from order picking to delivery, is essential for ensuring high-quality customer service and satisfaction (Miheso, 2019).

Labor costs constitute a substantial portion of warehouse operating expenses, particularly for third-party logistics providers (3PLs), where it can account for up to 50% of total operating costs (Wathe, 2019). Such high labor costs, combined with difficulties in inventory tracking and picking inaccuracies, result in shipping and delivery delays, further affecting customer satisfaction (Baker, 2021). Moreover, transportation and delivery expenses can represent a significant portion of the total cost of goods, reaching up to 15% or even 50%. Therefore, optimizing the transport system can lead to substantial cost savings, potentially as high as 30% (Kumar, 2024). Inaccurate physical inventory management, frequently caused by poor implementation of warehouse systems and automation processes, leads to backorders, customer dissatisfaction, and increased overall costs (Gurría, 2024).

While previous studies have explored various aspects of warehouse management and supply chain performance, there is a notable gap in research regarding the impact of warehouse optimization on the performance of distribution firms in Kenya, and how firm size may moderate this relationship. For instance; Wacuka (2023) investigated the relationship between warehouse management control and supply chain performance of FMCG Further, the studies did not show how firm size moderates the relationship between warehouse optimization and performance of distribution firms in Kenya. It is against this background that the current study seeks to establish the influence of warehouse optimization on performance of distribution firms in Kenya. In addition, the study sought to assess the moderating effect of firm size on the

relationship between warehouse optimization and performance of distribution firms in Kenya.

1.3 Objectives of the Study

The study was guided by a general objective and specific objectives;

1.3.1 General Objective

The general objective of this study was to establish the relationship between warehouse optimization and performance of distribution firms in Kenya.

1.3.2 Specific Objective

The study was guided by the following specific objectives;

1. To establish the relationship between product placement and performance of distribution firms in Kenya
2. To assess the relationship between warehouse flow and performance of distribution firms in Kenya
3. To determine the relationship between retrieval systems and performance of distribution firms in Kenya
4. To find out the relationship between warehouse layout and performance of distribution firms in Kenya
5. To assess the moderating effect of firm size and the relationship between warehouse optimization and performance of distribution firms in Kenya.

1.4 Research Hypothesis

The study sought to test the following research hypotheses;

1. H_0 Product placement has no significant effect on performance of distribution firms in Kenya.
2. H_0 Warehouse flow does not significantly affect performance of distribution firms in Kenya.

3. H_0 Retrieval systems has no significant effect on performance of distribution firms in Kenya.
4. H_0 Warehouse layout does not significantly affect performance of distribution firms in Kenya.
5. H_0 Firm size has no significant moderating effect on the relationship between warehouse optimization and performance of distribution firms in Kenya.

1.5 Significance of the study

This study would be significant to various stakeholders on the effect of warehouse optimization on performance of distribution firms in Kenya. Specifically, it provides useful insights, to management of distribution firms in Kenya, policymakers, researchers and practitioners.

1.5.1 Management of Distribution Firms

The study provides insight for firm owners and policymakers, on the effect of warehouse optimization on performance of distribution firms in Kenya. Thus, this study contributes by developing in-depth understanding regarding warehouse optimization and performance of distribution firms, and the outcomes can serve as springboard for future policy development, as well as guidance for the practitioners.

1.5.2 Stakeholders

The study also benefits many stakeholders since it informs the policy makers on the areas of the supply chain that require policy interventions for the purpose of providing an efficient supply chain. The findings also help the government of Kenya and other regulatory bodies formulate and bodies implement policies that would facilitate effective supply chain management strategies.

1.5.3 Researchers and Academicians

This study is of value to scholars and researchers as it adds knowledge to the existing research on warehouse optimization and performance of distribution firms. The study

generates empirical and theoretical body of knowledge which would be useful to scholars and supply chain practitioners. The research identified areas for further research and this would be useful to supply chain management students. It is hoped that this study makes positive contributions to promote further scientific research on the subject.

1.6 Scope of the study

This study focused on the effect of warehouse optimization on performance of distribution firms in Kenya. Warehouse optimization entails product placement, warehouse flow, retrieval systems, warehouse layout. The study also focused on assessing the moderating effect of firm size on the relationship between warehouse optimization and performance of distribution firms in Kenya. The target population was 1061 distribution firms in Kenya. The distribution firms formed the unit of analysis while warehouse managers formed the unit of observation. Warehouse managers were selected because they were directly involved with all warehouse optimization related activities in the distribution firms and are therefore in a position to provide the needed information on the effect of warehouse optimization on performance of distribution firms in Kenya. The study was conducted between March 2023 and December 2023.

1.7 Limitations of the Study

The study encountered several limitations that influenced the data collection process. To begin with, some employees were reluctant to provide information due to concerns about confidentiality and fear of possible repercussions, especially when responding to questions they perceived as sensitive or critical of the organization. This hesitation reduced the level of openness among a few respondents. To minimize this challenge, the researcher sought official authorization through a formal introduction letter, which helped build trust, assured respondents of the study's academic purpose, and improved access to the necessary data.

Another limitation arose from the demanding work schedules of some participants, which made them less available and initially unresponsive to the questionnaires. Their

limited time contributed to delays in completing the data collection process. To overcome this constraint, the researcher implemented consistent follow-up measures including phone calls, visits, and email reminders to encourage participation and ensure that a sufficient number of responses were obtained.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the review of the literature related to the relationship between warehouse optimization (product placement, warehouse flow, retrieval systems and warehouse layout) firm size and performance of distribution firms in Kenya. It consists of theoretical review, conceptual framework and furthermore, it also represents key findings of past similar studies, a critique of existing literature, research gaps and finally the summary.

2.2 Theoretical framework

A theory is a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting the phenomena (Kivunja, 2018). According to Kothari, 2019) theories are analytical tools for understanding, explaining, and making predictions about a given subject matter. A formal theory is syntactic in nature and is only meaningful when given a semantic component by applying it to some content such as facts and relationships of the actual historical world as it is evolving. This study was anchored on institutional theory, queuing theory, technology acceptance model, the theory of Constraints (TOC) and theory of the firm.

2.2.1 Institutional Theory

Institutional Theory was proposed in the year 1991 by Powell and DiMaggio. The concern of this theory is the process in which structure, rules, routine and norms are developed as guidelines for behaviors that are acceptable (Aghbar & Al-Qaseem, 2024). According to Frazelle, 2021) institutional theory emphasizes that institutional environments are crucial in shaping organizational structure and actions on the Warehouse Layout Design and inventory process (Taiwo, Jaiyesim & Aondover, 2024). The theory stipulates that organizational decisions are not driven purely by rational goals of efficiency, pallet rack system and developing the optimal warehouse

layout design, Institutions are transported by cultures, structures, and routines and operate at multiple levels (Kibet, Wachiuri & Senelwa, 2024).

Institutional performance is defined as socially generated concepts of organizational performance that become firmly institutionalized as legitimate characteristics of institutional achievement (Warsewicz & Kulykovets, 2023). The institutional theory explains not just why and how organizations' structures and practices become entrenched, but also how and why they change. Two types of institutional pressure are useful in achieving change. Coercive pressures can encourage organizational change either directly or indirectly via institutional dependencies when new regulations are imposed and enforced (Jebungei, 2022).

Mimetic pressures to mimic successful forms, for example, might encourage change during periods of change or high uncertainty (Gu, Goetschalckx, & McGinnis, 2022). New standards or practices gain legitimacy in the environment as they become more generally recognized and followed. Finally, these norms and/or procedures gain enough legitimacy that refusing to follow them is considered unreasonable (Bartholdi & Hackman, 2023). A rule requiring women employees to resign upon marriage, for example, was historically prevalent in some industries but is today considered discriminatory and outdated, as is a dress code prohibiting women employees from wearing trousers (Kumar, 2023).

Koster, Le-Duc, and Roodbergen (2021) distinguishes between institutional myths and accepted and entrenched institutional practice or standard on the one hand. Institutional myths are rules or procedures that are only ceremonially accepted for an organization to attain or maintain legitimacy in the institutional environment (Frazelle, 2021). Structure vocabularies, such as specific job names, organizational responsibilities, processes, and rules, are adopted by organizations in their context (such as gender diversity policies). The adoption and prominent display of these institutionally approved trappings of legitimacy contribute to the preservation of an aura of good faith in organizational conduct. Legitimacy in the institutional environment is important for the survival of an organization (Aghbar & Al-Qaseem, 2024).One critique of institutional theory is that it neglects the agency of organizations and individuals.

Institutional theorists argue that organizations are constrained by their environment and have little control over their actions (Taiwo, Jaiyesim & Aondover, 2024). However, organizations and individuals also have the agency to challenge institutional norms and create change. Another critique is that institutional theory does not provide a clear explanation of how institutions emerge and change over time (Kibet, Wachiuri & Senelwa, 2024). The theory assumes that institutions are stable and durable, but in reality, institutions can be unstable and subject to change. Additionally, institutional theory has been criticized for its focus on conformity and isomorphism, which may lead to a lack of innovation and creativity within organizations (Warsewicz & Kulykovets, 2023). Organizations may become too focused on meeting institutional expectations and neglect their own goals and objectives (Jebungei, 2022).

The study was based on Institutional Theory in determining influence of Warehouse Layout. The estimation of space requirement can also be measured using the Little's Law (Gu, Goetschalckx, & McGinnis, 2022) where warehouse is viewed as a queuing system. The theory holds that for a queuing system in steady state, the average length of a queue equals the average arrival time times the average waiting time (Bartholdi & Hackman, 2023). The average space required can also be calculated by multiplying the average arrival rate of products multiplied by the average time inventory is stored (Kumar, 2023). Institutional Theory was used to establish the effect of product placement on performance of distribution firms in Kenya.

2.2.2 Queuing Theory

Queuing theory has its origins in research by Agner Krarup Erlang in 1909. This is a mathematical study of waiting lines or queues. The theory enables mathematical analysis of several related processes, including arriving at the back of the queue, waiting in queue (a storage process) and being served in front of the queue (Hernandez & Muller, 2021). The theory permits the derivation and calculation of several performance measures including the average waiting time in the queue or the system, the expected number waiting or receiving service, and the probability of encountering the system in certain states such as empty, full, having an available server or having to wait a certain time to be served (Mensah, 2020). Queuing model can be utilized to

model the planning system variations, identifying risks and genetic algorithm can be implemented to solve the integrated optimization problem. It is also demonstrated that the proposed optimization approach can significantly improve a production system with respect to total travelling time, total work-in-progress (Shale, 2024)

The existing methodologies to independently optimize facilities layout design and material handling systems are mainly based on minimizing the costs (Mutai & Moronge, 2023). This is despite the fact that the inherent variability causes an accumulation of work- in- progress at the various stages of production which eventually affects competing strategies of an enterprise such as time, cost and quality (Aluoch, 2023). Therefore, an integrated methodology that incorporates the manufacturing variability and concurrently optimizes the layout designs and materials handling is essential (Guliti *et al*, 2019). Queuing model can be utilized to model the planning system variations, identifying risks and genetic algorithm can be implemented to solve the integrated optimization problem. It is also demonstrated that the proposed optimization approach can significantly improve a production system with respect to total travelling time, total work-in-progress in the system, utilization and quantity of material handling equipment and required area (Hailu, 2019).

However, there are also some criticisms of queuing theory. One limitation is that it assumes that customers arrive at the system randomly and independently. In reality, customer arrivals may be influenced by external factors such as promotions, weather, and events, which can lead to deviations from the assumptions of the theory (Nee, 2020). Another limitation is that queuing theory assumes that service times are constant and independent. In practice, service times may be variable and dependent on factors such as customer needs and preferences, which can affect the accuracy of the model (Bogale, 2020). Queuing theory also assumes that customers are homogenous and that their needs and preferences are identical. In reality, customers may have different needs and preferences, and their behavior can be difficult to predict, which can affect the accuracy of the model (Dagnachew, 2023). Finally, queuing theory assumes that the system is stable and that the arrival rate is less than the service rate. In practice, systems can be subject to sudden changes, such as unexpected surges in

demand, which can lead to long waiting times and queue congestion (Udeh & Karaduman, 2023).

Queuing systems focus on analysis of customer wait times. Therefore, the theory can be applied to pretty much every aspect of the business, and it can be customize for virtually every probability (Hura & Dushimimana, 2024). The theory can be applied in figuring out materials requirements planning (MRP), supply chain management, ideal stock levels, and even employee shift scheduling. Therefore, in material management, Queueing theory can help forecast customer demand, which in turn helps determine how much stock to keep on hand at any given time (Odhiambo & Noor, 2023). Queueing theory was relevant to this study because it helps when considering the best inventory management techniques for businesses (e.g., first in, first out vs. last in, first out). This theory is used to assess the effect of warehouse flow on performance of distribution firms in Kenya

2.2.3 Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) was a framework introduced by Fred Davis in 1986 as part of his doctorate proposal, and soon gained popularity as one of the most useful framework to understand how users are willing to accept or reject a new technology (Kim & Alvarez, 2021). TAM has proved to be a mature and reliable model to measure how a new technology, is well received by the stakeholders in the oil and petroleum industry, (Okafor, 2020). TAM is one of the most widely used theories in innovation and information systems research. It has been considered as the most robust, parsimonious and persuasive model in innovations acceptance behaviour (Mutua, 2022).

The technology acceptance model is the information systems theory that shows how users come to accept and use technology broadly it emphasize that the intensity of an individual intention to use a technology can be explained jointly by his or her perception about the technologies usefulness and attitude towards the technology in the firm (Onwuchekwa, 2019).The model suggested that when organization users are presented with a new technology, a number of issues influence their decision about how and when they will use the technology, perceived usefulness and perceived ease

of use (Gercina & Maria, 2021). Macharia *et al* (2023) concluded in a statistical meta-analysis of the technology acceptance model as applied in various fields analyzed88 published studies that provided sufficient data to be credible. The results showed that TAM was a valid and robust model that has been largely used, but which potentially has wider implications in organizations (Kibe & Ngugi, 2024).

TAM model has been criticized severally. One limitation is that the model focuses primarily on individual user perceptions and does not account for the social and organizational factors that can influence technology adoption (Sitienei, Mugun & Maru, 2023). The model assumes that users are rational decision-makers who base their adoption decisions solely on their perceptions of usefulness and ease of use, without considering other factors such as social influence, organizational culture, and power dynamics (Clough & Sanderson, 2022). Another limitation of TAM is that it does not provide a comprehensive view of the technology adoption process. The model focuses primarily on the factors that influence users' behavioral intention to use technology, but does not account for other stages in the adoption process, such as actual technology use, satisfaction, and continuance (Agboola & Shaibu, 2019). Additionally, TAM has been criticized for its narrow focus on specific technology features, such as ease of use and usefulness, and does not account for other important factors that can influence user adoption, such as system reliability, security, and privacy concerns (Eder, 2022). Technology Acceptance Model (TAM) is used in this study to assess the effect of retrieval systems on performance of distribution firms in Kenya.

2.2.4 The Theory of Constraints

Theory of constraints is an approach to the management of operations and it was developed by Goldratt (1984). It provides a management theory of how organizations should be run especially the when handling scarce financial resources. The concept was extended to theory of constraints (TOC) with a publication which views any manageable system as being limited in achieving more of its objectives by a very small number of constraints (Ernawati, *et al*, 2022).

There is always one constraint and the TOC uses a focusing process to identify the constraint and restructure the resources around it (Mohamud, *et al*, 2023) TOC emphasizes on the optimization of performance within a defined set of constraints of the existing process and it provides an action framework which combines the activities of the managers and the visible system elements (Kibet, Wachiuri & Senelwa, 2024).

TOC views project financial resources as systems consisting of resources, which are linked by the processes they perform. The goal of project financial resources serves as the primary judge of success. Within that system, a constraint is defined as anything that limits the project financial resources from achieving higher performance relative to its purpose (Jinxiang, Goetschalckx & Mcginnis, 2019). The pervasiveness of interdependencies within the organization makes the analogy of a chain, or network of chains, very descriptive of a system's processes. Just as the strength of a chain is governed by its single weakest link, the TOC perspective is that the ability of any project to achieve its goal is governed by a single, or at most very few, constraints (Saifudin, Zainuddin & Azwardi, 2023).

However, there are also some criticisms of TOC. One limitation is that the theory assumes that constraints are static and unchanging. In reality, constraints can be dynamic and can shift over time as the system evolves (Buzu, 2021). This can make it difficult to identify and address the most important constraints, and can limit the effectiveness of the TOC approach (Jinxiang, Goetschalckx & Mcginnis, 2019). Another limitation of TOC is that it focuses primarily on optimizing performance at the bottleneck, without considering the broader system implications of these optimizations (Ernawati, *et al*, 2022). Additionally, TOC has been criticized for its reliance on quantitative data and its limited consideration of human factors in organizational performance. The theory does not account for the complex interactions between people and technology in organizational performance, which can limit its effectiveness in certain contexts (Mohamud, *et al*, 2023).

The theory of constraints defines a set of tools that project managers can use to manage constraints, thereby increasing performance. Most projects can be viewed as a linked set of processes that transform inputs into outputs (Kibet, Wachiuri & Senelwa, 2024).

TOC conceptually models this system as a chain, and advocates the familiar adage that a chain is only as strong as its weakest link (Jinxiang, Goetschalckx & Mcginnis, 2019). This theory incorporates the idea that the goal or mission of an organization exists, and organizations can be measured and controlled by variations on three measures sufficiency of funds, funds disbursement timeline and reliability of funding (Saifudin, Zainuddin & Azwardi, 2023). The Theory of Constraints is used to find out the effect of warehouse layout on performance of distribution firms in Kenya.

2.2.5 Theory of the Firm

Theory of the firm was developed by Jensen and Meckling, (1976). The theory is a microeconomic approach devised in neoclassical economics that every firm operates in order to make profits (Rodriguez & Patel, 2021). According to Jensen and Meckling, (1976) companies ascertain the price and demand of the product in the market, and make optimum allocation of resources for increasing their net profits (Adebayo, 2020). The theory of the firm consists of a number of economic theories that explain and predict the nature of the firm, company, or corporation, including its existence, behaviour, structure, and relationship to the market (Pila, Muturi & Olweny, 2022). Firms are key drivers in economics, providing goods and services in return for monetary payments and rewards. Organizational structure, incentives, employee productivity, and information all influence the successful operation of a firm in the economy and within itself (Meiryani *et al*, 2020).

According to Wayongah (2019), the behavioural approach places emphasis on explaining how decisions are taken within the firm, and goes well beyond neoclassical economics. “people possess limited cognitive ability and so can exercise only ‘bounded rationality’ when making decisions in complex, uncertain situations” (Pervan & Josipa, 2024). Thus individuals and groups tend to "satisfice"—that is, to attempt to attain realistic goals, rather than maximize a utility or profit function. The firm cannot be regarded as a monolith, because different individuals and groups within it have their own aspirations and conflicting interests, and that firm behaviour is the weighted outcome of these conflicts (Kioko, 2024). Organizational mechanisms (such as "satisficing" and sequential decision-taking) exist to maintain conflict at levels that

are not unacceptably detrimental. Compared to ideal state of productive efficiency, there is organizational slack (Ali, 2024).

The firm emerges because extra output is provided by team production, but the success of this depends on being able to manage the team so that metering problems (it is costly to measure the marginal outputs of the co-operating inputs for reward purposes) and attendant shirking (the moral hazard problem) can be overcome, by estimating marginal productivity by observing or specifying input behaviour (Wayongah, 2019). Such monitoring as is therefore necessary, however, can only be encouraged effectively if the monitor is the recipient of the activity's residual income (otherwise the monitor herself would have to be monitored, ad infinitum) (Rodriguez & Patel, 2021). The firm, therefore, is an entity that brings together a team that is more productive working together than at arm's length through the market, because of informational problems associated with monitoring of effort. In effect, therefore, this is a "principal-agent" theory, since it is asymmetric information within the firm which must be overcome (Adebayo, 2020). The firm emerges as a means of centralizing monitoring and thereby avoiding costly redundancy in that function (since in a firm the responsibility for monitoring can be centralized in a way that it cannot if production is organized as a group of workers each acting as a firm) (Pila, Muturi & Olweny, 2022).

According to Meiryani *et al*, (2020) the theory of the firm assumes that firms are profit-maximizing entities that operate in a rational, self-interested manner. In reality, firms are composed of human beings with diverse goals and motivations, and their behavior may not always align with the profit-maximizing assumptions of the theory (Pervan & Josipa, 2024). Another limitation of the theory of the firm is that it does not account for the role of social and environmental factors in firm behavior (Kioko, 2024). The theory assumes that firms are solely motivated by profit, and does not consider the broader social and environmental impacts of their actions. This can limit the ability of the theory to explain the behavior of firms in contexts where social and environmental considerations are important (Ali, 2024). Additionally, the theory of the firm has been criticized for its limited consideration of non-hierarchical organizational structures, such as cooperatives or worker-owned firms. These alternative organizational

structures challenge the assumptions of the theory, and may require alternative frameworks for understanding their behavior (Wayongah, 2019).

The existence of firms derives from ‘asset specificity’ in production, where assets are specific to each other such that their value is much less in a second-best use (Rodriguez & Patel, 2021). This causes problems if the assets are owned by different firms (such as purchaser and supplier), because it will lead to protracted bargaining concerning the gains from trade, because both agents are likely to become locked into a position where they are no longer competing with a (possibly large) number of agents in the entire market, and the incentives are no longer there to represent their positions honestly: large-numbers bargaining is transformed into small-number bargaining (Adebayo, 2020). Theory of the firm was used to assess the moderating effect of firm size on the relationship between warehouse optimization and performance of distribution firms in Kenya.

2.2.6 Resource Based View Theory

Resource based view Theory was developed by Penrose's (1959). The Resource-Based View (RBV) theory of the firm posits that a company's competitive advantage and performance are primarily driven by its unique bundle of internal resources and capabilities (Rodriguez & Patel, 2021). This perspective suggests that firms can sustainably outperform competitors by leveraging resources that are valuable, rare, inimitable, and non-substitutable (VRIN). In essence, the RBV focuses on how firms can develop and exploit their internal strengths to gain a competitive edge in the marketplace (Adebayo, 2020).

One of the key assumptions of the RBV is resource heterogeneity, which implies that firms possess different sets of resources and capabilities. These resources can vary widely and include tangible assets like physical infrastructure and machinery, as well as intangible assets such as intellectual property, brand reputation, or organizational culture (Pila, Muturi & Olweny, 2022). The RBV argues that the unique combination and configuration of these resources distinguish one firm from another and shape its competitive advantage (Meiryani *et al*, 2020). Another critical assumption is resource immobility, which suggests that resources and capabilities are not perfectly mobile

across firms. This immobility can be due to various factors such as path dependency, where historical decisions and investments constrain future choices, or causal ambiguity, where the link between resources and firm performance is not well understood by competitors (Pervan & Josipa, 2024). Additionally, social complexity and unique historical conditions can also contribute to resource immobility, making it difficult for competitors to replicate a firm's advantages (Kioko, 2024).

While the RBV provides a compelling framework for understanding firm performance, it has faced several critiques. One common criticism is its tautological nature, wherein competitive advantage is defined in terms of possessing valuable, rare, inimitable, and non-substitutable resources (Ernawati, *et al*, 2022). Some scholars argue that this definition lacks explanatory power and can be circular in its reasoning. Moreover, the RBV has been criticized for its limited external focus, as it tends to overlook the role of external factors such as market dynamics, industry structure, and environmental changes in shaping firm performance (Ali, 2024).

In the context of distribution firms in Kenya, the RBV offers valuable insights into understanding their performance dynamics. These firms can analyze their internal resources and capabilities to identify areas where they have a competitive advantage (Wayongah, 2019). For example, a distribution firm may possess unique knowledge of local markets, established relationships with suppliers, or a highly efficient logistics system. By leveraging these internal strengths, the firm can differentiate itself from competitors and achieve superior performance (Rodriguez & Patel, 2021). Furthermore, distribution firms can develop dynamic capabilities to adapt to changing market conditions and sustain their competitive advantage over time (Adebayo, 2020). This may involve continually innovating distribution channels, investing in technology infrastructure, or developing agile responses to shifts in customer preferences or regulatory requirements (Pila, Muturi & Olweny, 2022). This study used resource based view theory to assess performance of distribution firms in Kenya.

2.3 Conceptual Framework

A conceptual framework is a structured explanation often presented in diagrammatic and narrative form of the key concepts, variables, and presumed relationships that guide a study. It serves as a logical map showing how the researcher understands the phenomenon under investigation and how different variables are expected to interact (Erickson & Kovalainen, 2019). The independent variables are product placement, warehouse flow, retrieval systems and warehouse layout. The moderating variable is firm size while performance of distribution firms in Kenya is the dependent variable.

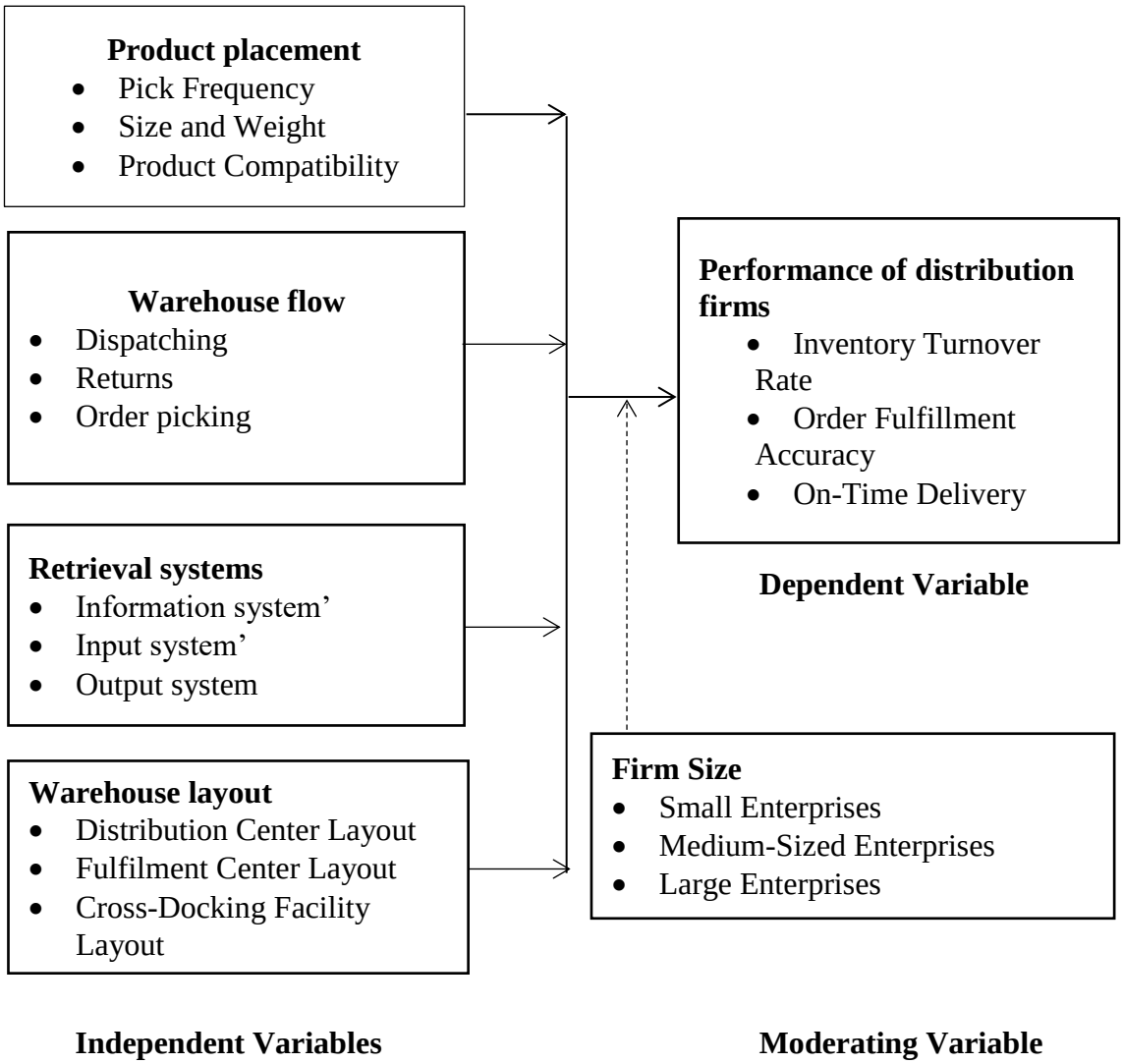

Figure 2.1: Conceptual Framework

2.3.1 Product Placement

Product placement is a fundamental aspect of warehouse management that significantly influences operational efficiency, labor productivity, and cost-effectiveness. By strategically placing products within the warehouse, businesses can minimize travel time, reduce handling efforts, and improve order fulfillment speed and accuracy (Aghbar & Al-Qaseem, 2024). Three critical factors that inform optimal product placement include pick frequency, size and weight, and product compatibility. These considerations play a central role in aligning storage strategies with workflow efficiency (Taiwo, Jaiyesim & Aondover, 2024). Optimizing product placement through careful attention to pick frequency, size and weight, and product compatibility is crucial for achieving operational excellence in warehousing (Kibet, Wachiuri & Senelwa, 2024). These factors, when integrated into warehouse design and inventory management systems, help reduce costs, improve safety, and boost order fulfillment efficiency. As supply chains become increasingly dynamic, continuous assessment and adjustment of product placement strategies remain essential for maintaining competitiveness and responsiveness in warehouse operations (Warsewicz & Kulykovets, 2023).

Pick frequency refers to how often a particular product is retrieved or picked from storage to fulfill customer orders. In warehousing optimization, understanding and utilizing pick frequency is essential for determining the most efficient placement of items (Jebungei, 2022). High-frequency items—often referred to as fast-moving stock—should be placed in easily accessible areas near the packing or dispatch zones (Gu, Goetschalckx, & McGinnis, 2022). These items are picked frequently and therefore benefit from minimal travel time and reduced picker fatigue. This approach aligns with the Pareto Principle (80/20 rule), which suggests that 20% of the items typically account for 80% of the order volume (Bartholdi & Hackman, 2023). Conversely, slow-moving items can be stored in less accessible or higher storage areas since they are picked less often. By organizing inventory according to pick frequency, warehouses can streamline operations, improve picker productivity, and reduce order processing time. Warehouse Management Systems (WMS) often assist in tracking

pick frequency and dynamically adjusting placement as demand patterns evolve (Kumar, 2023).

Another important consideration in product placement is the physical characteristics of products—specifically their size and weight. Warehouses typically use a combination of storage systems (e.g., pallet racking, shelving, bins) that are suitable for various item dimensions and loads (Koster, Le-Duc, & Roodbergen, 2021). Heavier or bulkier items are usually placed on lower levels of racking systems to avoid safety hazards and make manual handling easier. This reduces the risk of injury to workers and damage to goods. For items that require mechanical handling (e.g., forklifts or pallet jacks), placement should ensure sufficient aisle space and proper height clearance (Frazelle, 2021). Smaller and lighter items, on the other hand, can be stored at higher levels or in tighter spaces, including mezzanines or vertical carousels. They may also be grouped in bins or totes for more efficient space utilization. By aligning placement with size and weight characteristics, warehouses can enhance storage density, reduce handling time, and maintain a safer working environment (Aghbar & Al-Qaseem, 2024).

Product compatibility pertains to the physical, chemical, or regulatory requirements that govern how certain products can be stored in proximity to others. This factor is vital for maintaining safety, quality control, and regulatory compliance (Taiwo, Jaiyesim & Aondover, 2024). Incompatible items—such as chemicals and food products, flammable goods and electronics, or perishables and non-perishables—must be stored in segregated zones to prevent contamination, spoilage, or hazardous reactions (Kibet, Wachiuri & Senelwa, 2024). In some cases, regulatory guidelines or industry standards mandate specific separation protocols. For example, food-grade items must be stored in hygienic areas that meet sanitation requirements, away from industrial chemicals or non-food materials (Warsewicz & Kulykovets, 2023). Furthermore, product compatibility also affects the efficiency of order picking. Frequently co-ordered items (complementary products) may be stored closer together to streamline the picking process (Jebungei, 2022). This is referred to as order-based slotting. By anticipating picking patterns and minimizing unnecessary movement

between incompatible zones, warehouses can optimize order consolidation and enhance throughput (Gu, Goetschalckx, & McGinnis, 2022).

2.3.2 Warehouse Flow

A warehouse process flow is a visual chart or diagram that shows the main activities of the warehouse. It's a subcomponent of warehouse organization. A process flow illustrates how goods are received, the process they go through, how they are shipped, and any stages in between (Hernandez & Muller, 2021). A warehouse system flow chart illustrates the movement of warehouse goods in a visual format. All warehouse flow charts can be broken down into at least three stages: receiving, storage, and shipping. This type of flow chart works best for small warehouses or limited product lines, where products aren't separated after receiving (Mensah, 2020). A warehouse is a commercial building used for the storage of goods. The most important element of warehousing is order processing which generally refers to the workflow coupled with delivering products ordered by a customer (Shale, 2024).

The prime objective of most warehouses is to facilitate the movement of goods from suppliers through the supply chain to the end consumer while meeting the customers' demand in a timely and cost-effective manner (Mutai & Moronge, 2023). In the old days of warehousing, inventory was seen to represent the wealth of a company. However, these days this is not the case anymore. Instead, many companies have noticed the high cost associated with holding inventory (Aluoch, 2023). In practice, however, there are overriding factors such as meeting customer demand and expectations that make it hard to operate without inventory (Guliti *et al*, 2019). Warehouse flow entails dispatching, returns and order picking. The goods receipt and dispatch processes are central to any warehouse or distribution centre. Without a strong goods in process, all downstream activities are in peril. Without an efficient dispatch set-up, time to market and therefore profit will suffer, (Hailu, 2019).

Dispatching is the final stage in the warehouse flow process, where products are prepared for shipment and sent to customers or distribution points. It plays a critical role in ensuring that the flow from receiving to shipping is efficient and that the goods reach their destination on time (Nee, 2020). The dispatching process involves several

key activities, including order verification, packing, labeling, and sorting shipments based on delivery schedules and destinations. After the items are picked and packed, they are moved to a designated staging or dispatch area where they are organized according to the appropriate carrier or delivery route (Bogale, 2020). Efficient dispatching is crucial for maintaining a steady flow within the warehouse. By optimizing the location of dispatch areas and integrating technology such as Warehouse Management Systems (WMS) or Transportation Management Systems (TMS), warehouses can streamline the dispatching process, reduce delays, and improve the accuracy of shipments (Dagnachew, 2023). Proper coordination between the picking, packing, and dispatching stages ensures that orders are processed and shipped in a timely manner, which is essential for customer satisfaction and operational efficiency (Udeh & Karaduman, 2023).

Returns, or reverse logistics, are an integral part of the warehouse flow, though they involve the movement of goods in the opposite direction—from customers back to the warehouse. Managing returns efficiently is essential for minimizing disruptions to warehouse operations and maintaining a continuous, effective flow of goods (Hura & Dushimimana, 2024). The returns process begins when customers return items due to defects, dissatisfaction, or other reasons. Returned goods must be inspected, processed, and either restocked, refurbished, or disposed of according to their condition (Odhiambo & Noor, 2023). Effective returns management helps ensure that the reverse flow of goods doesn't interfere with the primary flow of orders being processed. A dedicated returns area within the warehouse ensures that returns can be handled separately, preventing them from clogging up the main picking or shipping zones (Hernandez & Muller, 2021). Additionally, a well-organized returns process can improve inventory accuracy and help recover value from returned items by efficiently restocking products that can be sold again. Technology such as RFID and WMS can facilitate the returns process by tracking returned items, updating inventory in real-time, and ensuring that goods are processed quickly and accurately (Mensah, 2020).

Order picking is one of the most crucial activities in warehouse flow, involving the retrieval of products from storage locations to fulfill customer orders. It is typically the most labor-intensive and time-consuming part of warehouse operations,

accounting for a significant portion of the warehouse's operational costs (Shale, 2024). Order picking can be carried out using various strategies, such as piece picking, where individual items are picked per order, batch picking, which involves picking multiple orders at once, or zone picking, where pickers are assigned specific areas to retrieve products (Mutai & Moronge, 2023). The efficiency of the picking process is vital for maintaining smooth warehouse flow, as delays or errors during picking can result in slower order fulfillment and increased operational costs (Aluoch, 2023). Optimizing order picking often involves strategic slotting—placing high-demand items in easily accessible areas to reduce the time spent walking between aisles (Guliti *et al*, 2019). Automation tools, such as pick-to-light systems, voice-directed picking, or automated guided vehicles (AGVs), can further enhance the efficiency of the picking process, improving accuracy and reducing labor costs (Hailu, 2019).

2.3.3 Retrieval Systems

Automated storage and retrieval systems, sometimes known as ASRS or AS/RS, are made of a variation of computer-controlled systems that automatically place and retrieve loads from set storage locations in a facility with precision, accuracy and speed (Kim & Alvarez, 2021). An automated storage and retrieval system (ASRS or AS/RS) consists of a variety of computer-controlled systems for automatically placing and retrieving loads from defined storage locations (Okafor, 2020). Automated storage and retrieval systems (AS/RS) are typically used in applications where: There is a very high volume of loads being moved into and out of storage, Storage density is important because of space constraints, no value is added in this process (no processing, only storage and transport and accuracy is critical because of potential expensive damages to the load (Mutua, 2022). AS/RS systems are designed for automated storage and retrieval of parts and items in manufacturing, distribution, retail, wholesale and institutions (Onwuchekwa, 2019).

The systems operate under computerized control, maintaining an inventory of stored items. Retrieval of items is accomplished by specifying the item type and quantity to be retrieved (Gercina & Maria, 2021). The computer determines where in the storage area the item can be retrieved from and schedules the retrieval. It directs the proper

automated storage and retrieval machine (SRM) to the location where the item is stored and directs the machine to deposit the item at a location where it is to be picked up (Macharia *et al*, 2023). A system of conveyors and or automated guided vehicles is sometimes part of the AS/RS system. These take loads into and out of the storage area and move them to the manufacturing floor or loading docks (Kibe & Ngugi, 2024). To store items, the pallet or tray is placed at an input station for the system, the information for inventory is entered into a computer terminal and the AS/RS system moves the load to the storage area, determines a suitable location for the item, and stores the load (Sitienei, Mugun & Maru, 2023). As items are stored into or retrieved from the racks, the computer updates its inventory accordingly. The benefits of an AS/RS system include reduced labor for transporting items into and out of inventory, reduced inventory levels, more accurate tracking of inventory, and space savings. Items are often stored more densely than in systems where items are stored and retrieved manually (Clough & Sanderson, 2022).

Within the storage, items can be placed on trays or hang from bars, which are attached to chains/drives in order to move up and down. The equipment required for an AS/RS include a storage & retrieval machine (SRM) that is used for rapid storage and retrieval of material (Agboola & Shaibu, 2019). SRMs are used to move loads vertically or horizontally, and can also move laterally to place objects in the correct storage location. The trend towards Just In Time production often requires sub-pallet level availability of production inputs, and AS/RS is a much faster way of organizing the storage of smaller items next to production lines (Eder, 2022).

2.3.4 Warehouse Layout

A warehouse layout is the planned design of a warehouse to streamline overall operations. The right layout should help to improve the flow of production and distribution. A good warehouse layout should improve the flow of the facility (Ernawati, *et al*, 2022). But there are many more things a warehouse layout can do to enhance the way you operate. These objectives contribute to the main purpose of keeping costs down and productivity up. The most significant objective of a warehouse layout is to optimize the way warehouse space is used (Mohamud, *et al*, 2023). Using

warehouse space effectively allows companies to reduce the time it takes to produce a product and get it out the door, gain visibility into what is and isn't working in the warehouse, and organize inventory to streamline the process at every stage (Kibet, Wachiuri & Senelwa, 2024).

In supply chain management, the warehouse layout serves as a cornerstone in the optimization of operational efficiency and the facilitation of seamless workflow processes. It encompasses the planned design of a warehouse facility, aimed at maximizing space utilization, enhancing productivity, and minimizing operational costs (Jinxiang, Goetschalckx & Mcginnis, 2019). The warehouse layout varies depending on the specific functions and requirements of the facility, with distinct layouts tailored to different types of warehouses, such as distribution centers, fulfilment centers, and cross-docking facilities (Saifudin, Zainuddin & Azwardi, 2023).

Distribution center layout design is particularly focused on efficiently managing the flow of goods through the facility, from receiving to storage and ultimately to outbound shipping. These layouts are strategically organized to accommodate high volumes of goods and support rapid order fulfilment to meet customer demand (Buzu, 2021). The arrangement of storage areas, picking zones, loading docks, and receiving areas is optimized to facilitate efficient inbound and outbound logistics, ensuring timely delivery of products to customers (Jinxiang, Goetschalckx & Mcginnis, 2019).

Similarly, fulfilment center layout design is tailored to the specific needs of e-commerce fulfilment operations. These warehouses are optimized for the picking, packing, and shipping of individual customer orders with speed and accuracy (Ernawati, *et al*, 2022). Fulfilment center layouts often incorporate automated storage and retrieval systems, conveyor belts, and robotic technologies to maximize order processing efficiency and handle a large number of SKUs with minimal human intervention (Mohamud, *et al*, 2023).

On the other hand, cross-docking facility layout design focuses on the rapid transfer of goods from inbound to outbound vehicles with minimal storage time. These layouts are designed to facilitate seamless cross-docking operations, minimizing inventory

holding costs, handling expenses, and transit times (Kibet, Wachiuri & Senelwa, 2024). The layout includes designated receiving and shipping areas, staging zones, and efficient material flow paths to expedite the transfer of goods and optimize supply chain efficiency (Jinxiang, Goetschalckx & Mcginnis, 2019).

In all these types of warehouse layouts, common objectives such as optimizing space utilization, streamlining workflow processes, and ensuring accessibility and ergonomics remain paramount (Saifudin, Zainuddin & Azwardi, 2023). By carefully designing the layout to align with the specific functions and requirements of the facility, companies can achieve significant improvements in warehouse performance and enhance their competitive advantage in the marketplace. Therefore, investing in strategic warehouse layout design is essential for maximizing operational efficiency and achieving organizational success in today's dynamic business environment (Ernawati, *et al*, 2022).

2.3.5 Firm Size

Firm size, as a construct for firm characteristics, is one of the most acknowledged determinants of a financial performance (Rodriguez & Patel, 2021). Indeed, firms with the greatest market share and assets report relatively better performance. The market power and access to capital markets of large firms may give them access to investment opportunities that are not available to smaller ones (Adebayo, 2020). Firm size has become such a routine to use as a control variable in empirical corporate finance studies that it receives little to no discussion in most research papers even though not uncommonly it is among the most significant variables. Firms of different size distinguish themselves along different observable and unobservable dimensions. Therefore, there are many different ways of defining a firm's size category (Pila, Muturi & Olweny, 2022)

Discussions of the role of firm size in explaining firm performance have been ongoing in the fields of business organization and industrial economics. Early research, notably by Meiryani *et al*, (2020) and Wayongah (2019) emphasizes the importance of scale economies and other efficiencies in larger firms. On the other hand, the structure-conductperformance paradigm highlights the importance of market concentration and

conduct in explaining profitability. In particular, Pervan and Josipa (2024) argue that the advantages of larger firms stem from their market power and greater access to capital markets. Kioko (2024) also attribute variations in profitability to group strategic behavior in different industries. With a few exceptions, notably Ali (2024), there is considerable evidence in early empirical studies (Wayongah, 2019) to support a positive relationship between firm size and profitability. However, as Rodriguez and Patel (2021) point out, many of these studies neglect the possible effects of other factors, such as market structure, entry barriers and firm strategies. More recent studies have attempted to control for these market and firm-specific characteristics and found more equivocal support for a relationship between firm size and profitability. For instance, Adebayo (2020) find a firm's market share instead of its size plays a significant role in explaining its relative performance. Rodriguez and Patel (2021) find evidence in US retailing industries to support Porter's (2018) conjecture that both small and large firms can effectively capture niche markets, while middle-sized firms are 'stuck in the middle' in the sense that they are less competitive than their counterparts in either end of the firm size distribution (Pila, Muturi & Olweny, 2022)

Firm size is a critical variable in business analysis and policymaking, with enterprises typically categorized into small, medium-sized, and large categories based on various criteria such as employee count, revenue, or assets (Kioko, 2024). Firm size serves as a crucial moderating variable in the relationship between warehouse optimization and the performance of distribution firms (Meiryani *et al*, 2020). Within the context of distribution logistics, small, medium-sized, and large enterprises exhibit distinct operational dynamics that influence how warehouse optimization strategies translate into performance outcomes (Pervan & Josipa, 2024). The classification of firms by size provides insights into the varying degrees of resource availability, organizational capabilities, and market reach, thereby shaping the effectiveness of warehouse optimization efforts (Ali, 2024).

Small distribution firms, characterized by limited resources and localized operations, may face challenges in implementing comprehensive warehouse optimization strategies (Wayongah, 2019). Their smaller scale and narrower market presence may restrict their ability to invest in advanced technology or infrastructure upgrades.

However, innovative approaches tailored to their specific needs, such as lean inventory management or agile picking processes, can enhance operational efficiency and responsiveness (Rodriguez & Patel, 2021).

Medium-sized distribution firms typically exhibit moderate growth rates and a more formalized organizational structure compared to their smaller counterparts. They may have greater flexibility and resources to invest in warehouse optimization initiatives, such as automated inventory systems or route optimization algorithms (Adebayo, 2020). These firms can leverage their regional or national presence to implement standardized processes and streamline distribution operations, resulting in improved performance metrics such as order fulfillment rates and delivery lead times (Pila, Muturi & Olweny, 2022).

Large distribution firms, operating on a global scale with diversified product lines and extensive market reach, possess significant resources and technological capabilities to drive warehouse optimization to its fullest extent (Meiryani *et al*, 2020). They may invest in state-of-the-art warehouse management systems, robotics, and predictive analytics to achieve efficiency gains and cost savings across their distribution networks. By optimizing inventory levels, minimizing stockouts, and maximizing throughput, large firms can enhance their competitive position and customer satisfaction levels (Wayongah, 2019).

The moderating effect of firm size underscores the importance of tailoring warehouse optimization strategies to the specific needs and capabilities of distribution firms across different size categories (Pervan & Josipa, 2024). While small firms may focus on lean and agile approaches to maximize resource utilization, medium-sized firms can implement standardized processes to achieve operational consistency, and large firms can leverage advanced technologies to achieve economies of scale and competitive advantages (Kioko, 2024). Therefore, understanding the moderating effect of firm size is essential for designing effective warehouse optimization strategies that enhance the performance of distribution firms. By aligning optimization efforts with the unique characteristics and capabilities of small, medium-sized, and large

enterprises, logistics managers can unlock value, improve efficiency, and drive sustainable growth across the distribution network (Wayongah, 2019).

2.3.6 Performance of Distribution Firms

Distribution firms, also known as distributors or wholesalers, are pivotal entities within the supply chain. Their primary function is to act as intermediaries between manufacturers or producers and retailers or end consumers (Meiryani *et al*, 2020). Essentially, they bridge the gap between production and consumption by facilitating the movement of goods from the point of production to the point of consumption. One of the key roles of distribution firms is to purchase goods in bulk from manufacturers or producers and then sell them in smaller quantities to retailers or end consumers (Pervan & Josipa, 2024). This bulk purchasing allows them to benefit from economies of scale, often securing discounted prices from manufacturers due to the large volumes they acquire. By aggregating demand from multiple retailers or consumers, distribution firms achieve cost efficiencies in procurement (Kioko, 2024).

Moreover, distribution firms typically maintain warehouses or storage facilities where they stockpile goods acquired from manufacturers. These facilities serve as hubs for inventory management, enabling firms to store goods temporarily before distributing them further downstream (Ernawati, *et al*, 2022). Effective warehouse management is essential for ensuring the availability of products and minimizing stockouts. In terms of logistics and transportation, distribution firms are responsible for managing the movement of goods from warehouses to retail outlets or directly to consumers (Ali, 2024). This involves coordinating shipments, optimizing delivery routes, and ensuring timely and efficient distribution of goods. By investing in logistics infrastructure and transportation networks, distribution firms enhance their ability to meet customer demand and deliver products promptly (Wayongah, 2019).

Inventory turnover rate measures how efficiently a distribution firm manages its inventory by analyzing how many times inventory is sold and replaced within a given period. It is calculated by dividing the cost of goods sold (COGS) by the average inventory value. (Rodriguez & Patel, 2021) A high inventory turnover rate indicates that a firm is selling its inventory quickly, which can lead to lower holding costs,

reduced risk of obsolescence, and improved cash flow. For distribution firms, maintaining an optimal inventory turnover rate is crucial (Adebayo, 2020). Excess inventory ties up capital and warehouse space, while low turnover rates may indicate poor demand forecasting or ineffective inventory management practices. By optimizing inventory turnover, distribution firms can minimize costs and enhance profitability (Pila, Muturi & Olweny, 2022).

Order fulfillment accuracy measures the percentage of orders that are processed and delivered correctly without errors or discrepancies. It involves ensuring that the right products are picked, packed, and shipped to the correct destination within the specified timeframe (Meiryani *et al*, 2020). High order fulfillment accuracy is essential for maintaining customer satisfaction, minimizing returns and exchanges, and preserving brand reputation. Distribution firms must invest in robust order management systems, warehouse automation technologies, and employee training to improve order accuracy (Pervan & Josipa, 2024). By reducing errors in order fulfillment processes, firms can enhance customer loyalty, increase repeat business, and gain a competitive advantage in the market (Kioko, 2024).

On-time delivery measures the percentage of orders that are delivered to customers within the promised delivery window or service level agreement (SLA). It reflects the reliability and efficiency of a distribution firm's transportation and logistics operations. Timely delivery is critical for meeting customer expectations, preventing stockouts, and avoiding disruptions in the supply chain (Ernawati, *et al*, 2022). Distribution firms need to optimize their transportation networks, route planning, and delivery scheduling to ensure on-time delivery (Ali, 2024). This may involve leveraging real-time tracking technologies, collaborating with reliable carriers, and implementing contingency plans for unexpected delays. By consistently meeting delivery deadlines, firms enhance customer satisfaction and build a reputation for reliability and trustworthiness (Wayongah, 2019).

2.4 Empirical Review

2.4.1 Product Placement and Performance of Distribution Firms

Aghbar and Al-Qaseem (2024) investigated on the impact of product placement on brand awareness and consumer behavior among university students of An-Najah National University in Arab TV Series Netflix Series as a Case Study. This study employed a mixed-methods approach A detailed qualitative and quantitative analysis was used. A content analysis was conducted on four Arab TV series available on Netflix. The quantitative approach included a conducted survey with a sample of 390 students. The study found a positive context and the product's association with a main character enhance the impact. The greater the number of appearances, the greater the impact, however, although drama series contain the largest number of products, comedy is more noticeable and has a stronger impact. The study concluded that product placement increases audience purchasing intent and, in some cases, enhances brand loyalty, as audiences move through several stages of brand awareness.

Taiwo, Jaiyesim and Aondover (2024) researched on product placement in Namaste Wahala in the global film industry and brand recall in Nigeria. The study employed a traditional positivist research design, which informed the choice of the survey method. The study sampled respondents from Caleb University and LASUSTECH in Lagos State, with 400 questionnaires administered. The study found that product placement advertising strategy in the movie 'Namaste Wahala' was not highly effective. Moreover, brands are placed in foreign movies more than those in Nigerian movies. The study concluded that foreign movie producers are more adept at utilizing product placement as a marketing strategy compared to Nigerian counterparts.

Kibet, Wachiuri and Senelwa (2024) conducted a study on product placement and performance of distribution firms in Kenya. This study used both descriptive and explanatory research designs. In addition, this study employed a positivist research philosophy. The target population was based on the total of 1061 registered distribution firms in Kenya. The sample size for the study was 290 distribution firms. The study found that product placement is statistically significant in explaining the performance of distribution firms in Kenya. The study concluded that product

placement has a positive and significant effect on the performance of distribution firms in Kenya.

Warsewicz and Kulykovets (2023) conducted a study on product placement as an effective tool for the brand positioning. The study established that the increased competition about quality and price forces the company to take planned actions, ensuring their distinction and originality of the offering services. A tool for achieving a competitive advantage is the brand, reflecting on one hand the essence of the business and focusing on associations around the name and logo and on the other hand representing the axis of activities within marketing communications. Functioning of the business is associated with making appropriate strategic decisions in terms of brand positioning associated with custom tools, such as product and brand placement. This is a consequence of the differentiation of the product offer as a result of the needs of consumers in terms of quantity, requirements, and preferences of consumers. Product and brand placement refers to both the visible and invisible parts of the brand, referring to the social nature of the consumption of products with a well-known brand. Brand positioning uses the product and brand placement in movies, entertainment programs, and books and other printed materials and video games. The growing popularity of this tool is the result of its efficiency on the one hand and on the other a consequence of the intensification competitive activities and the desire to ensure the proper brand's market position.

Jebungei (2022) conducted a study on the influence of advertising on organizational performance of cosmetic manufacturing firms in Kenya. The research design adopted was cross sectional descriptive design. The population of the study comprised of all the 8 cosmetic companies operating in Kenya and all of them participated hence the study was a census. The study used primary data which was collected using self-administered questionnaires. The data collected was analyzed using statistical package for social sciences and presented in tables and charts. The study found out that advertisement helps the companies create awareness among customers for their products and services but also serves as a useful vehicle in promoting brand image of products and services offered at the target market. The study established that advertising in the cosmetic industry enables the companies to create good image and

promote the reiterate purchase of the product or service, create large market segment which leads to the development of larger market, maintain superior stand in the industry, establish good relationship with potential customers and reduce consumer dissonance.

Gu, Goetschalckx, and McGinnis (2022) conducted a comprehensive review of warehouse operations and found that efficient item placement—particularly based on pick frequency—leads to significant improvements in picking speed and inventory throughput. Their findings suggest that optimizing the location of high-demand items near dispatch areas can reduce operational bottlenecks and increase order fulfilment rates, which directly contributes to organizational efficiency. Bartholdi and Hackman (2023) emphasized the role of size and weight-based placement in enhancing warehouse safety and productivity. Their study showed that placing heavy items on lower racks and lighter, fast-moving products at more accessible levels not only reduces injury risks but also enhances employee efficiency. This improved safety and workflow leads to better labor utilization and lower handling costs, both of which are critical for the financial performance of distribution firms.

Kumar (2023) assessed the influence of product placements in films and television on consumers brand awareness. Product placements are being thought to be more beneficial as they are incorporated in the storyline and therefore this is hard to be missed by the viewers. The objective of the research is to find the reason for people to connect to products, their attitude towards product placements and how this attitude influences their brand awareness and buying. There have been studies before showing why marketers and consumers are preferring product placements over commercial advertisements however this study focusses on the effect of product placements on consumer brand awareness. The data for this research has been collected by a questionnaire that includes questions on general opinion as well as the influence of product placements on Brand awareness. The data has been analyzed using Advance Analytics Methods (Random Forest and Association Analysis). The former method helped in identifying the important factors and later method helped to see the various combination of factors influencing product placements in films and television.

Koster, Le-Duc, and Roodbergen (2021) examined the impact of product compatibility on warehouse operations. They found that storing compatible products together minimizes picking errors and simplifies the packing process. Their research concluded that such strategic grouping improves order accuracy and customer satisfaction—key indicators of performance in logistics and distribution sectors. These findings underscore that product placement is not only a matter of physical arrangement but also a contributor to service quality and customer retention. Frazelle (2021) provided empirical evidence showing that optimized storage layouts reduce congestion, minimize retrieval times, and improve workflow balance across warehouse teams. His research emphasized that strategic placement reduces unnecessary travel and handling, which boosts overall warehouse productivity and lowers operational expenses. This, in turn, enhances the profitability and competitiveness of distribution firms.

2.4.2 Warehouse Flow and Organization Performance

Hernandez and Muller (2021) examined on warehouse flow efficiency and operational performance in global retail supply chains. The study adopted a quantitative descriptive design involving 310 warehouse supervisors from multinational retail firms operating. Stratified sampling was used to select respondents from large distribution centers. The study found that optimized warehouse flow, characterized by streamlined picking routes, reduced handling times, and improved storage layouts significantly increased order fulfillment speed and reduced operational costs. The study concluded that competitive firms that invest in flow optimization strategies enhance supply chain responsiveness, minimize errors, and ultimately strengthen overall firm performance.

Mensah (2020) conducted a study on warehouse flow processes and performance of manufacturing firms in West Africa. The research used a mixed-methods approach combining surveys and observational assessments across 45 medium and large manufacturing firms in Ghana and Côte d'Ivoire. A total of 180 respondents, including warehouse managers and operations officers, were sampled using purposive sampling. The study found that improved warehouse flow through better material movement coordination, automated sorting, and structured loading systems positively influenced

production continuity, inventory accuracy, and delivery reliability. The study concluded that manufacturing firms that prioritize warehouse flow improvements achieve higher operational stability, reduced bottlenecks, and better firm performance outcomes.

Shale (2024) investigated on warehouse flow and performance of distribution firms in Nairobi City County, Kenya. A cross-sectional survey design was employed, targeting 255 managers across 51 distribution firms. A sample size of 155 was selected through simple random sampling. The study found that efficient warehouse flow significantly enhances the operational performance of distribution firms. The study concluded that optimizing warehouse flow processes can contribute to improved delivery times, reduced operational costs, and greater customer satisfaction, thereby strengthening overall firm performance in Nairobi's competitive distribution sector.

Mutai and Moronge (2023) conducted a study on the influence of warehouse management on organizational productivity in state corporations in Kenya. The study applied a descriptive research design. The target populations of the study were the employees of the Kenya Electricity Generating Company Limited (KENGEN). Data was collected by taking a census survey on the 117 respondents by the answering of questionnaires both quantitatively and qualitatively with a pilot test first conducted with 11 respondents. It was notable that there existed a strong positive relationship between the independent variables and dependent variable. This implied that the variables were very significant therefore needed to be considered in any effort to boost organizational productivity in state corporations in Kenya. The data findings analyzed also showed that taking all other independent variables at zero, a unit increase in stock control lead increase in organizational productivity in state corporations; a unit increase in distribution planning lead to increase in organizational productivity in state corporations. This inferred that access to stock control contributed most to organizational productivity in state corporations. The most significant factor was stock control. The study recommended for the enhancement stock control and the workforce needed external guidance with regard to stock control.

Aluoch (2023) researched on the effects of warehousing management on organizational efficiency, a case study of Ouru Super Stores, Kisii. The study adopted a descriptive case study design to obtain pertinent and precise information on the current status of the phenomena, situations and groups under study Mugenda and Mugenda (1999). The target population of the study included employees of Ouru Super Stores whose target population is 126. The study used 30% from each department to draw a sample size of 39 respondents. The study found out that better coordination of the people and activities dealing with materials is one of the contributions of inventory classification to stores efficiency; similarly, the study found out that hastened inventory turnover, better communication and cooperation and reduction of material obsolescence are also the contribution of inventory classification to stores efficiency. Reduction of inventory costs is one of the contributions of material codification to stores efficiency; on the other hand the study found out that efficiency in procurement and quick communication are also the contribution of material codification to stores efficiency.

Guliti *et al* (2019) conducted a study on the effect of integrated warehouse operation efficiency on organizations performance. The research design that was used on this research have been casual and descriptive research design. This work had focused on employees of those selected universities. This population has been considered a better source of information for conducting the study to accomplish the desired objectives of the study. The sampling design that was used in this research was probabilistic sampling design with a sampling technique of stratified random sampling for selecting respondents from those universities as well as the different departments working within the organization & then simple random sampling was used to select respondent after stratification. The study reveals that there's high quality dating between warehouse operation efficiency and organizational overall performance such that when the management do not have timely, nicely prepared and correct records in order to administer its warehouse, the organizational overall performance goes to lower and when the management have nicely prepared, timely and correct records which will administer the warehouse activities so that organizational overall performance is going to growth

Hailu (2019) conducted a study on the Effect of Warehousing Practices on Organizational Performance. This research examined the effect of warehousing on organizational performance through a case study of My Wish Enterprise Plc. To achieve the objectives of this study an explanatory research design was used. Data was collected through a questionnaire survey from a total of 60 employees. The results of this study indicate that warehousing dimensions such as (receiving activity, storage activity, picking activity, shipping activity and order picking) have positive and significant relationship with organizational performance. The findings of the study indicate also that employees were well aware of the importance of warehousing activities on organizational performance. The results also indicate that, unlike order picking, the four warehousing dimensions (receiving activity, storing activity, picking activity, shipping activity) have a relatively more positive and significant effect on organizational performance. These dimensions contribute significantly (47.6%) to organizational performance

Nee (2020) conducted a study on the effect of warehouse flow management system and business performance: case study of a regional distribution center. This paper examines Warehouse Management System (WMS) practices and their effects on operations. The study found that Companies that manage warehousing of their products are expected to implement WMS in order to maintain their competitive edge in the global market place. It is concluded that WMS has a positive impact on operations measures.

Bogale (2020) conducted a study on the assessment of warehouse performance: a case of Ethiopian trading enterprise. In today's challenging and competitive world, success can be hinge on whether a warehouse operation is productive and effective enough to meet the expectations of customers. This research study however provide a brief introduction to warehouse flow management, performance measurement and metrics or key performance indicators based on the most recognized literature. Generally, the study findings have suggested that the levels of warehouse performance are approximately moderate in the case of Ethiopian trading enterprise in terms of the four key performance indicators. The study concluded that this research was conducted in an attempt to reveal the status of warehouse performance in Ethiopian trading

enterprise by making particular emphasis to the measurement of the level of warehouse performance

Dagnachew, (2023) focused on the role of warehouse personnel practice on warehouse performance- A Case of Ethiopian Electric Utility" reveals how poor performance of warehouse personnel negatively affected the overall operation of the corporation. The study showed that the utilization of unqualified personnel in the organization is contributing to the organization's lower performance. The study concludes by showing that the corporation's management didn't recognize the importance of qualified warehouse personnel to the good performance of the corporation.

Udeh and Karaduman (2023) conducted a study on the impact of supply chain in the warehouse management systems of Turkish automotive industry. The increase in production capacity among 13 automotive players operating in the sector, this has reflected on the WMS impact in the productivity of the industry despite economic slowdown. Looking at the general growth level in all the production segments in the Turkish automotive industry in 2013, Sales volume grew by 19% and reached a record high of 664,655 units. This research reveals that SCM in the WMS helps the general effectiveness and efficiency of the entire organization by reducing operating costs, inventory levels and increase responsiveness to demand in strengthening the overall competitive advantage of the organization. When installing WMS to facilitate SCM in automotive manufacturing facilities, the clear goals and objectives of the project should be discussed prior and analyzed by all the sections and departments that will apply the systems in their individual functions. After implementation with automation, this will advance the productivity and output of the plant and ensure that the production site is producing at full capacity

Hura and Dushimimana (2024) conducted a study on the effect of warehouse management on the organizational performance in a manufacturing company. A case of Cimerwa limited in Rusizi District-Rwanda. The purpose of this study was to analyze the effect of warehouse management on the organizational performance in a manufacturing company. The study found that data was analyzed by using both quantitative data and qualitative data by presenting the findings of respondents through

the mean and standard deviation. The study concluded that there is a positive link between warehouse management and the organizational performance of Cimerwa; thus, the warehouse at Cimerwa moves, stores, tracks, and ships items

Odhiambo and Noor (2023) conducted a study on the effect of warehouse consolidation and performance of distribution firms in Nairobi city county, Kenya. The performance of distribution logistics impacts tremendously on the performance of an entire organization, this is mainly because it links the organization to the customers and thereby has much influence on customer satisfaction which influences customer loyalty, arguably the single most important asset of an organization. The target population in this study was 255 managers working in procurement, operations, distribution/logistics, and warehouse and finance departments in the 51 distribution companies in Nairobi City County. The study found that warehouses are the key aspect of modern supply chains and play a vital role in the success, or failure, of Distribution Firms. The study concludes that warehousing consolidation has effect on performance of distribution firms in Nairobi City County, Kenya.

Chelangat and Ndeto (2024) conducted a study on the effect of warehousing management practices and performance of distribution firms in Nairobi city county Kenya. Distribution firms play a pivotal role in the Kenyan economy by facilitating the flow of goods and services essential for both local consumption and export. Based on the findings, the study researched that the management of distribution firms in Kenya should implement a standardized receiving and inspection process. The study concludes that inventory management has a positive and significant effect on performance of distribution firms in Nairobi City County Kenya

2.4.3 Retrieval Systems and Performance of Distribution Firms

Kim and Alvarez (2021) examined on retrieval systems and operational performance of multinational manufacturing firms across Europe and Asia. The study adopted a descriptive survey design and targeted 420 IT managers drawn from 70 large multinational manufacturing firms. A stratified sampling technique was used to select 210 respondents. The study found that advanced retrieval systems, especially automated data indexing and real-time search capabilities significantly improved

decision-making speed, reduced operational delays, and enhanced production planning accuracy. The study concluded that competitive firms that invest in robust retrieval technologies achieve superior operational efficiency, minimized downtime, and improved overall performance in dynamic manufacturing environments.

Okafor (2020) conducted a study on the influence of digital retrieval systems on performance of financial institutions in West Africa. The research employed an explanatory research design involving 300 employees from 15 commercial banks across Nigeria and Ghana. Purposive sampling was used to select ICT and operations staff knowledgeable about retrieval systems. The study found that the adoption of electronic retrieval systems significantly improved service delivery speed, reduced customer waiting time, and enhanced internal process efficiency. The study concluded that the integration of modern retrieval technologies plays a vital role in strengthening institutional performance, customer satisfaction, and competitiveness within Africa's financial sector.

Mutua (2022) investigated retrieval systems and performance of logistics firms in Nairobi City County, Kenya. The study adopted a cross-sectional research design and targeted 180 operations managers from 36 logistics companies. A sample size of 120 respondents was selected using simple random sampling. The study found that efficient retrieval systems such as electronic document management, automated tracking archives, and rapid data search tools greatly improved order processing accuracy, reduced operational errors, and enhanced customer response time. The study concluded that logistics firms that implement reliable retrieval systems are more likely to achieve higher levels of operational effectiveness, customer satisfaction, and overall firm performance in Nairobi's rapidly expanding logistics industry.

Onwuchekwa (2019) conducted a study on organisation of information and the information retrieval system. This development has resulted in technological innovations for faster and more efficient processing and storage of information, as individuals and organisations strive to keep up with increasing demands. The value of information organisation cannot be overemphasized. The volume of information generated, transmitted, and stored is of such immense proportion that without adequate

organisation, the retrieval process would be cumbersome and frustrating. This chapter will highlight and describe the roles of an information retrieval system and the context of information organisation in several institutions. It will also discuss the various information retrieval tools and the different models used in information retrieval process. The ultimate goal of this chapter is to enable students, practicing librarians, and others interested in information services to understand the concepts, principles, and tools behind information organisation and retrieval. The conclusion of the chapter will emphasize the need for continuous evaluation of these principles and tools for sustained improvement

Gercina and Maria (2021) examined on the impact retrieval systems on warehouse operations in Norway. The operational tool for collecting data was two online surveys. Data were collected over 3 weeks in March/April 2021. A total of 18 companies responded to survey 1, and 15 companies responded to survey 2. Results from this study indicated that the implementation of automated storage and retrieval systems leads to increased speed and capacity in warehouse operations. There is also an indication that implementation does not necessarily eliminate the possibility for human error regarding picking mistakes. The study concluded that there is a high tendency for improved space and storage utilization after implementing automated storage and retrieval systems.

Macharia *et al* (2023) assessed the effects of retrieval systems on performance of logistics firms in Nairobi County. The target population was logistic firms within Nairobi County. Data was collected from 10 firms in the logistic industry suppliers in Nairobi. A set of items, based on the research model, was developed, and aggregated into four scales for measuring the use of IT in company, and three scales for measuring the company performance. The study found that there is a strong relationship between retrieval systems and the performance of logistic firms in Nairobi County. The ANOVA result for all variables indicates that there was a highly significant relationship between the variables. The study concluded that retrieval systems have a significant influence on company performance.

Kibe and Ngugi (2024) determined the effect of retrieval systems on performance of public health institutions in Kiambu County, Kenya. This research used descriptive research design. In research, a descriptive research design refers to the collection and presentation of detailed information about a particular participant or small group, frequently including the accounts of subjects themselves. The descriptive research design is normally used because it places more emphasis on a full contextual analysis of a few elements and conditions and their interrelations, which relies on qualitative data. Primary research data was gathered using questionnaires. The questionnaires containing both open-ended and close-ended questions were administered. The study established that retrieval systems enables the execution of a real-time warehouse management system that greatly minimize the paperwork conventionally which are associated with warehouse functions and also makes sure timely and perfect flow of inventory and information. Retrieval systems provide a comprehensive range of fulfillment, warehousing and distribution services for the Public Health Institutions. The study concluded that retrieval systems have a significant influence on warehouse performance.

Sitienei, Mugun and Maru (2023) conducted a study on the knowledge storage, retrieval and employee performance. The study used explanatory research design. The target population was 3147 employees in public technical institutions in Rift valley and 343 formed the sample size as per Cochran's formula. Random sampling technique was used to identify the respondents who filled the questionnaires. Data was analyzed using descriptive and inferential statistics and presented in form of frequencies, percentages charts and graphs. The study showed that there is a relationship between knowledge storage, retrieval and employee performance. The study further revealed that employee engagement moderates the relationship between knowledge storage, retrieval and employee performance.

Clough and Sanderson (2022) researched on the performance of information retrieval systems using test collections. Evaluation is highly important for designing, developing and maintaining effective information retrieval or search systems as it allows the measurement of how successfully an information retrieval system meets its goal of helping users fulfil their information needs. In this paper we discuss system-

oriented evaluation that focuses on measuring system effectiveness: how well an information retrieval system can separate relevant from non-relevant documents for a given user query. We discuss the construction and use of standardised benchmarks - test collections - for evaluating information retrieval systems. This paper describes test collections which have been widely used in information retrieval evaluation and provide an approach for measuring system effectiveness.

Agboola and Shaibu (2019) conducted a study on the impact of ICT on information retrieval system in Academic Libraries. To achieve the purpose of this research, the study was guided by three (3) objectives, three (3) research questions and four (4) commendations. Survey research design was adopted for the study and data was gathered through the instrument of a questionnaire. Data collected were analyzed using descriptive statistics, frequency count and percentages. Information is considered an economic resource that improve national development and other resources such as education, security, politics, businesses, infrastructure and social amenities. This view stems from evidence that the possession, manipulation, and use of information and communication technology can increase the cost-effectiveness of many physical and cognitive processes. Therefore, the needs for latest ICT facilities such as computers, internet, intranet/extranet, local area network (LAN), printer, scanner, machines (photocopy, bindery and laminating), broadcasting technologies (radio, public address speaker and television), projector and telephony among others in academic libraries are necessity for information retrieval system and effective service delivery

Eder (2022) assessed analytical approach for a performance calculation of shuttle-based storage and retrieval systems with multiple-deep and class-based storage. This approach is used in the design process of SBS/RS and in the upgrading process of existing SBS/RS. With this approach, it is possible to evaluate the improvement in the performance of multiple-deep storage system by applying a class-based storage policy. The basis of this calculation method is a continuous-time, open-queueing system with limited capacity. The cycle times of lifts and shuttles, as determined by a spatial value approach, combined with a probability-based approach to mention the storage policy. To take the multiple-deep storage into account, another probability-based approach is

applied. A European material handling provider had given the data used in this publication.

Maio et al (2024) conducted a study on the effect of Configuration of an automated storage and retrieval system via simulation in Italy. The automation of warehouse operations has become essential for boosting efficiency and competitive edge in logistics management. The study concluded that it employs a Genetic Algorithm (GA) to efficiently manage sequences of dual cycles, where pairs of storage and retrieval tasks are combined to reduce overall handling time. The study concluded that this paper has presented the development of a simulator designed for the configuration and management of an AS/RS in warehouse operations.

Mlimbila and Mbamba (2020) conducted a study on the role of information retrieval systems usage in enhancing port logistics performance: evidence from the Dar Es' Salaam port, Tanzania. This study investigated the role of information systems usage in enhancing port logistics performance using the port of Dar es Salaam, Tanzania, as an example. The study established that relationships exist between information systems usage and the perceived decrease in shipping and trucking costs, timely delivery of goods and services, perceived increase in trade volume, and enhanced organizational logistics capability. Based on the conclusion, the study affirms that adoption of information retrieval systems can enhance on-time delivery of services and goods reduce trucking and shipping costs, and increase organizational capability.

Myongho (2024) researched on information organization and retrieval using a topic maps-based ontology. The objective of this study is to explore how a Topic Maps-based ontology approach affects users' searching performance. Forty participants participated in a task-based evaluation where two dependent variables, recall and search time, were measured. The results of this study indicate that a Topic Maps-based ontology information retrieval (TOIR) system has a significant and positive effect on both recall and search time, compared to a thesaurus-based information retrieval (TIR) system. These results suggest that the inclusion of a Topic Maps-based ontology is a beneficial approach to take when designing information retrieval systems.

2.4.4 Warehouse Layout and Performance of Distribution Firms

Ernawati, *et al* (2022) examined on the effect of warehouse layout on work productivity at PT Perkasa Primarindo. This research used quantitative research methods. The population in this study was PT Perkasa Primarindo's warehouse employees, as many as 25 people, and the sample in this study was 25 employees. The study found a positive and significant influence between warehouse layout variables on work productivity variables. The study concluded that the warehouse layout variable significantly affects work productivity.

Mohamud, *et al* (2023) assessed on the role of warehouse layout and operations in warehouse efficiency: a literature review. The study used systematic reviews. The study found that a well-planned warehouse layout for a supply chain organization leads to higher productivity by meeting customer demands as shortly as possible. The study concluded that warehouse layout can improve optimization effectiveness and allow business operations to reduce their operation time and also helps the organization streamline the process at every stage, from receiving inventory to dispatching the final goods.

Kibet, Wachiuri and Senelwa (2024) researched on warehouse layout and performance of distribution firms in Kenya. This study used both descriptive and explanatory research designs. In addition, this study employed a positivist research philosophy. The target population was based on the total of 1061 registered distribution firms in Kenya. The sample size for the study was 290 distribution firms. The study found that warehouse layout is statistically significant in explaining the performance of distribution firms in Kenya. The study concluded that warehouse layout has a significant and positive effect on the performance of distribution firms in Kenya.

Jinxiang, Goetschalckx and Mcginnis (2019) conducted a study on Research on warehouse design and performance evaluation. This paper presents a detailed survey of the research on warehouse design, performance evaluation, practical case studies, and computational support tools. This and an earlier survey on warehouse operation provide a comprehensive review of existing academic research results in the framework of a systematic classification. Each research area within this framework is

discussed, including the identification of the limits of previous research and of potential future research directions.

Saifudin, Zainuddin and Azwardi (2023) conducted a study on warehouse layout efficiency in small and medium enterprises (SMEs). This paper focus on the warehouse efficiencies in relation with the warehouse layout among SMEs manufacturing firms and its mediating effect with Management Information System (MIS). Overall 187 SMEs were involved in this study. Questionnaires (42 questions) were given to owners, factory managers or warehouse managers or warehouse section heads. All the SMEs involved came from various sectors such as food & beverages, metal & metal products, wood & wood products, paper and printing publication, machinery & engineering, plastics products, electrical & electronics, non-metallic mineral product, petro chemical and chemical, transport equipment, rubber & rubber products, and leather. Findings shows that the Warehouse Efficiency (AWE) correlates significantly with the Warehousing Layout variables above 0.7 while Warehousing MIS (AMIS) above 0.5. As for multiple regression test, variables AL and AMIS, the effects were significance with the R2 = 0.758 or 75.8 percent to explained in model AWE. In this test, it is found that there are significance value of variables AL (0.623) and AMIS (0.03). This reflects of the significance role of AL and AMIS in maintaining the warehouse efficiency. The results indicate the important of warehouse efficiency in the manufacturing firms

Buzu, (2021) conducted a study on the effect of warehousing management on warehouse performance. Both primary (questionnaires and interviews) and secondary sources of data were used. To achieve the objectives of this study, an explanatory and descriptive research design was used, and this study also applies a mixed research approach. Stratified simple random sampling was used to select the respondents for the study and, accordingly, one hundred one (101) sample sizes were taken for the study. The descriptive and inferential statistical tools such as; mean, standard deviation, percentage, correlation and multiple regressions were used to analyze collected data with the aid of IBM SPSS statistics version 20. The descriptive analysis shows that there is lack of space for loading and unloading items, lack of shelves, pallets and racks; poor well established put away process for received items, poor tight

control the storage areas, high warehousing cost, and high inventory cost. The multiple regression analyses reveals that receiving, storage, put away, order picking and shipping significantly influence warehouse performance of the organization. Hence, organizations are expected to enhance their warehousing management so as to gain better warehouse performance.

2.4.5 Firm Size and Performance of Distribution Firms

Rodriguez and Patel (2021) examined the relationship between firm size and financial performance among multinational consumer goods companies. The study employed a longitudinal research design using panel data from 120 multinational firms across North America, Europe, and Asia over a five-year period. The study found that larger firms consistently achieved higher financial performance due to economies of scale, stronger market influence, and resource advantages. The study concluded that in global markets, increasing firm size enhances competitive strength, operational capability, and long-term profitability.

Adebayo (2020) conducted research on firm size and performance of manufacturing enterprises in Sub-Saharan Africa. The study adopted a descriptive and correlational research design involving 350 manufacturing firms. Data were collected from CEOs and operations managers using structured questionnaires and secondary financial reports. The study found that larger firms outperformed smaller firms in productivity, innovation capacity, and profitability due to better access to capital, human resources, and technology. The study concluded that firm size is a critical determinant of competitive advantage in Africa's manufacturing sector, with larger enterprises demonstrating superior operational resilience and market stability.

Pila, Muturi and Olweny (2022) examined on the moderating effect of manufacturing firm size on indictors of financial uncertainty and performance of Kenya manufacturing firms. Descriptive design methodology was adapted for the Study which was target population of 856 Kenya manufacturing firms registered under KAM. Random sample of 90 firms was selected. The study found that indications of financial uncertainty and performance of the firms manufacturing goods and services in Kenya was moderated by firm size. The study concluded that firm size negatively

affects performance, moderation was insignificant, though this relationship was strengthened when size of firm was introduced.

Meiryani *et al* (2020) conducted a study on the effect of firm's size on corporate performance. The purpose of this study is to determine the effect of capital structure on firm's financial performance that is conducted on 55 manufacturing sector listed companies in Indonesia Stock Exchange. The data analysis is conducted using R Studio software. Study is used data panel analysis with random effect model. The result of this study are (1) firm's size has no effect on firm's financial performance which is proxied by return-on-assets; (2) firm's size has no effect on firm's financial performance which is proxied by market-to-book-value.

Pervan and Josipa (2024) conducted a study on influence of firm size on its business success. A firm may use different methods and diverse (non)financial analysis/indicators in order to evaluate its business success. However, one of the most widely applied methods refers to financial analyses that use profitability ratios as the key measures of firm's overall efficiency and performance. In this research we focused our attention on firm size and evaluated its influence on firm profitability. Other than by the size of a firm, a firm performance is affected by a variety of internal and external variables. Therefore, apart from mere investigating the relationship between firm size and performance, we also explored the impact of some other variables crucial in determining firm profitability. The analysis was conducted for the 2002-2010 period and the results revealed that firm size has a significant positive (although weak) influence on firm profitability. Additionally, results showed that assets turnover and debt ratio also statistically significantly influence firms' performance while current ratio didn't prove to be an important explanatory variable of firms' profitability

Kioko (2024) conducted a study on the relationship between firm size and financial performance of commercial banks in Kenya. This research was carried out using a correlational design. The target population of this study was all the 43 commercial banks in Kenya as at 31st December 2012. The panel data to be used was data from 1998 to 2012. This study used secondary data which was collected from Central Bank of Kenya and bank themselves. Firm size was measured using net assets total loans ,

total deposits (measured in Kenya shillings) and number of employees. Financial performance was measured using Return on Assets (ROA). Data which was collected was analyzed using correlation and regression statistics. Analyzed data was presented in tables. Study findings indicate that there is moderate correlation between three of the studied factors of bank size which include total deposits, total loans and total assets. The relationship between three of the independent variables, namely, total loans, total deposits, and total assets and the dependent variable (financial performance- ROA) of commercial banks were all found to be statistically significant. Total deposits and total loans had relatively stronger effects on financial performance compared to total assets. There was no significant relationship between number of employees and financial performance for commercial banks in Kenya

Ernawati, *et al* (2022) researched on the effect of warehouse layout on work productivity at Pt Perkasa Primarindo. This research used quantitative research methods. The population in this study was PT Perkasa Primarindo's warehouse employees and the sample in this study was 25 employees. The study found a positive and significant influence between warehouse layout and work productivity. The study concluded that warehouse layout has a significant effect on work productivity.

Asudi and Shale examined on the role of warehouse layout design on performance of distribution firms in Kenya; case of DHL supply chain. This study adopted a descriptive research design. The targeted population of this study consisted of DHL supply chain employees. The study found that storage systems, space planning and location mapping have a significance positive influence on performance of distribution firms. The study concluded that warehouse layout design influence performance of distribution firms in Kenya.

Ali (2024) conducted a study on the moderating effect of firm size on the relationship between management participation and firm performance. The study used descriptive survey approach. A structured and semi structured questionnaire was administered to 176 manufacturing firms comprising twelve sub sectors firms in Nairobi and surrounding areas. Out of which, 111 usable questionnaires were returned, giving a response rate of 63% which is adequate for analysis. While, Pearson’s product moment

correlation coefficient to indicate direction of relationship between the independent, dependent and moderator variables, multiple regression analysis was used to explain the nature of relationship between the variables. F-statistic was also used to decide the validity of the model while R-squared was used to help determine the model goodness-of -fit. The findings revealed that performance of manufacturing firms was significantly related to the nature and extent of management participation in strategic planning. The study thus concluded that management participation in strategic planning had significant effect on both the financial and non- financial performance indicators of the manufacturing firms. Hence management participation in strategic planning is a significant factor among firm level practices that enhance overall firm performance.

Wayongah (2019) conducted a study on firm size and firm financial performance: panel evidence from nonfinancial firms in Nairobi securities exchange, Kenya. Therefore, the purpose of this study was to analyze firm size and financial performance of non-financial firms listed in NSE, Kenya. The study was anchored on Economic, trade-off and Signaling theories. Population consisted of all the forty nonfinancial firms listed at NSE where purposive sampling was used. The study was based on correlational research design. Secondary data from 2010 - 2016 was obtained from financial reports using data collection sheet. The data was subjected to unit root test to check on stationarity. The data was analyzed using panel correlation and fixed effects multiple regression analysis by pooling the data of 28 firms over 7 years period to get 196 data points. The findings revealed that firm size accounted for insignificant variance of 2.65% in BPCI and with positive coefficient of .057844. Findings form this study may be helpful to shareholders in making prudent investment decisions; Management in formulation of policies; and academia as a basis of further research in finance and capital structure decisions

2.4.6 Performance of Distribution Firms

The distribution industry in Kenya draws its origin from the Kenya Uganda railway. Like in much of sub-Saharan Africa, Kenya has a largely linear spatial logistics structure situated along a single corridor. Much of the economic activity and many

cities and towns are located along the Northern corridor. According to World Bank (2021) the industry is characterized by Distribution firms struggling against a wave of physical and procedural impediments to transport goods across the corridor. Millions of tons of goods are moved along the corridor by road, railway and the Kenya pipeline (Bowersox & Closs, 2019). The location of Kenya as a gateway into the interior of Eastern Africa (Uganda, Rwanda, Burundi and Southern Sudan) through the port of Mombasa has created a much vibrant trade logistics industry. Many private Distribution firms compete along this corridor. Similarly, different modes of transportation such as road, rail and air freight compete. Inefficient public policies create serious bottlenecks especially in infrastructure and customs (World Bank, 2019).

In the East African region, major international Distribution industries only have agencies as opposed to full subsidiaries. The expansion of trade and investment translates into a huge potential for logistics companies in Kenya. According to Gichuru (2024) the major players in the logistics industry include clearing and forwarding agents, transport companies and express carriers. The first two sectors are well developed in Kenya seen by organized companies. However, the express carrier segment relies on international companies and is largely controlled by DHL Global Forwarding. There are presently over 1000 registered clearing agents most of whom do not have offices. Much of the trade is dominated by large companies which are often affiliates of global operators such as Panalpina and SDV Transami. In addition, a lot of trade cargo is carried by road transport companies which are not registered as logistics service providers (World Bank, 2019).

Air cargo operators are still limited as the service is expensive. One major challenge seen in the Distribution industry in Kenya is the limited use of ICT solutions especially at the ports and revenue offices. The pipeline system experiences many capacity constraints forcing many oil shippers to use the costly road transport. The growth of the industry has also been facilitated by logistics outsourcing especially from large manufacturing companies. Mulama (2019) argued that the increase in trade across the East African region offers better growth prospects for the distribution industry.

2.5 Critique of Existing Literature

Many studies have been done on warehouse optimization and performance of distribution firms, nevertheless, these studies focused on specific contexts, countries and organizations hence the study findings cannot be generalized to the current study. For instance; Udeh and Karaduman (2023) conducted a study on the impact of supply chain in the warehouse management systems of Turkish automotive industry. This research reveals that SCM in the WMS helps the general effectiveness and efficiency of the entire organization by reducing operating costs, inventory levels and increase responsiveness to demand in strengthening the overall competitive advantage of the organization. However, this study was conducted in Turkey hence the study findings cannot be generalized to the current study due to variation in economic development, legal framework and geographical boundaries between Kenya and Turkey. To fill the highlighted gaps, the current study sought to establish the effect of warehouse optimization on performance of distribution firms in Kenya.

In Ethiopia, Dagnachew, (2023) focused on the role of warehouse optimization on warehouse performance- A Case of Ethiopian Electric Utility" reveals how poor performance of warehouse personnel negatively affected the overall operation of the corporation. The study concludes by showing that the corporation's management didn't recognize the importance of qualified warehouse personnel to the good performance of the corporation. However, the study failed to show the influence of product placement, retrieval system and warehouse layout on organization performance hence the study findings cannot be generalized to the current study. To fill the highlighted gaps, the current study assesses the influence of warehouse optimization (product placement, warehouse flow, retrieval systems and warehouse layout) on performance of distribution firms in Kenya.

In Kenya, Jebungei (2022) conducted a study on the influence of warehouse optimization on organizational performance of cosmetic manufacturing firms. The study found out that advertisement helps the companies create awareness among customers for their products and services but also serves as a useful vehicle in promoting brand image of products and services offered at the target market. The study

established that advertising in the cosmetic industry enables the companies to create good image and promote the reiterate purchase of the product or service, create large market segment which leads to the development of larger market, maintain superior stand in the industry, establish good relationship with potential customers and reduce consumer dissonance. However, the study failed to show the influence of warehouse flow, retrieval system and warehouse layout on organization performance. To fill the highlighted gaps, the current study shows how warehouse flow, retrieval system and warehouse layout influences performance of distribution firms in Kenya.

Kioko (2024) conducted a study on the relationship between firm size and financial performance of commercial banks in Kenya. The study found that total deposits and total loans had relatively stronger effects on financial performance compared to total assets. There was no significant relationship between number of employees and financial performance for commercial banks in Kenya. However, the study focused on financial performance of commercial banks in Kenya hence the study findings cannot be generalized to the current study due to variation in legal and institutional frameworks between commercial banks and distribution firms in Kenya.

2.6 Research Gaps

Although there have been numerous studies in the field of warehouse optimization all over the world, the studies focused on specific countries, contexts, firms hence the study findings cannot be generalized to the current study. For instance; In the United States of America, according to the Aberdeen (2019), research on the improvement of warehouse and distribution center performance deduced that for many companies, improved warehouse and distribution center productivity remains a goal, not a reality. In United Kingdom, Sople (2024) warehousing network plays a major role in the success of the physical distribution of products. Udeh and Karaduman (2023) conducted a study on the impact of supply chain in the warehouse management systems of Turkish automotive industry, In Ethiopia, Dagnachew, (2023) focused on the role of warehouse optimization on warehouse performance- A Case of Ethiopian Electric Utility" reveals how poor performance of warehouse personnel negatively affected the overall operation of the corporation. However, these studies were

conducted in different countries hence the study findings cannot be generalized to a study done in Kenya due to variation in legal and institutional frameworks, economic development and geographical boundaries.

In Kenya, Jebungei (2022) conducted a study on the influence of warehouse optimization on organizational performance of cosmetic manufacturing firms and Kioko (2024) conducted a study on the relationship between firm size and financial performance of commercial banks in Kenya. Mutai and Moronge (2023) conducted a study on the influence of warehouse management on organizational productivity in state corporations in Kenya. Aluoch (2023) researched on the effects of warehousing management on organizational efficiency, a case study of Ouru Super Stores, Kisii. Kioko (2024) conducted a study on the relationship between firm size and financial performance of commercial banks in Kenya. However, none of these focused on the effect of warehouse optimization (product placement, warehouse flow, retrieval systems and warehouse layout) on performance of distribution firms in Kenya. In addition, none of these studies showed the moderating effect of firm size on the relationship between warehouse optimization and performance of distribution firms in Kenya. To fill the highlighted gaps, the current study sought to establish the effect of warehouse optimization on performance of distribution firms in Kenya. In addition, the study assesses the moderating effect of firm size on the relationship between warehouse optimization and performance of distribution firms in Kenya.

2.7 Summary of the Reviewed Literature

This study was anchored on institutional theory, queuing theory, technology acceptance model, the theory of Constraints (TOC) and theory of the firm. Institutional Theory was used to establish the effect of product placement on performance of distribution firms in Kenya. In addition, queuing theory was used to assess the effect of warehouse flow on performance of distribution firms in Kenya. Further, technology Acceptance Model (TAM) was used in this study to assess the effect of retrieval systems on performance of distribution firms in Kenya. The study also used the theory of Constraints to find out the effect of warehouse layout on performance of distribution firms in Kenya. Theory of the firm was used to assess the moderating effect of firm

size on the relationship between warehouse optimization and performance of distribution firms in Kenya

The empirical review revealed that warehouse optimization influences organization performance. In addition, the review showed that product placement influences organization performance. The empirical review also showed that warehouse flow influences organization performance. From the empirical review it was also revealed that retrieval systems influences organization performance. Warehouse layout was also found to influence organization performance.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains the methods that were utilized to conduct the research. It begins with an overview of the research design, research philosophy, target population, sample frame, sample and sampling techniques, data collection instruments, instrument validity and reliability, data collection procedures, pilot testing, and data processing and presentation techniques. Finally, the method of analysis that was utilized to test the hypotheses is presented.

3.2 Research Philosophy

Research philosophy refers to the set of assumptions, beliefs, and values that guide how a researcher understands reality, generates knowledge, and interprets findings. It provides the epistemological and ontological foundation upon which a study is designed and conducted. According to Saunders et al. (2019), research philosophy reflects the researcher's worldview and influences decisions regarding research design, methodology, data collection, and analysis. Several dominant research paradigms exist in social science research, notably positivism, interpretivism, realism, and pragmatism.

Positivism is grounded in the belief that reality is objective, stable, and independent of the researcher. Knowledge is generated through observable and measurable facts, and explanations are developed through hypothesis testing, statistical analysis, and empirical verification. Positivist studies emphasize quantification, objectivity, replicability, and causal relationships among variables (Saunders et al., 2019). Interpretivism, in contrast, assumes that reality is socially constructed and subjective. It focuses on understanding meanings, experiences, and interpretations from the perspective of participants. Interpretivist research commonly employs qualitative methods such as interviews and observations and is suitable where deep contextual understanding is required (Eriksson & Kovalainen, 2018).

Realism occupies a middle ground between positivism and interpretivism. While it acknowledges the existence of an objective reality, it argues that this reality is imperfectly understood due to social, cultural, and contextual influences. Realist studies may combine qualitative and quantitative approaches to uncover underlying mechanisms influencing observed outcomes. Pragmatism emphasizes practical consequences and problem-solving rather than philosophical purity. It allows the researcher to adopt methods quantitative, qualitative, or mixed that best address the research problem. Pragmatism is particularly useful for applied research where outcomes and usefulness take precedence over theoretical alignment.

This study adopted a positivist research philosophy because its primary objective is to examine causal relationships between variables, test hypotheses derived from existing theories, and generalize findings across a defined population. The positivist paradigm is appropriate where phenomena can be measured objectively and analyzed using statistical techniques. The study relies on quantitative data, structured instruments, and inferential analysis to test theoretical propositions. Positivism assumes that reality is observable, measurable, and governed by laws, enabling the researcher to manipulate independent variables and assess their effects on dependent variables in a controlled manner (Eriksson & Kovalainen, 2018). This aligns with the study's emphasis on objectivity, reliability, and validity. Furthermore, the positivist approach supports the use of deductive reasoning, where hypotheses are developed from established theories and tested using empirical data. The findings can therefore be replicated and verified, enhancing the scientific rigor and credibility of the research.

3.2.1 Research Design

Research designs refer to the overall strategies utilized in the integration of different components of a study in a logical and coherent way, thus making sure it will effectively address a research problem (Williamson & Johanson, 2019). The descriptive research design is a research method that systematically and accurately describes the characteristics of a phenomenon or population being studied (Metsamuuronen, 2019). Descriptive research is used to obtain information concerning

the current status of the phenomena and to describe "what exists" with respect to variables or conditions in a situation(Devi, 2017).

This research used a descriptive research design. This type of research design is very reliable in providing answers to questions of where, who, how and when, that are related to the phenomenon under investigation (Viechtbauer, Smits & Kotz, 2017). In addition, the descriptive research design is preferred when collecting information relating to the current phenomenon under research, and is used in describing “what exists” in relation to the variables under investigation. In this type of research, the researcher describes the current state of affairs and he/she has no influence on the research variables (Yevale, 2019).

This research also employed the explanatory research design, also referred to as the causal research design, given that the study is aimed at determining the nature and extent of cause-and-impact relationships. The objective of an explanatory research is to identify associations, as well as causal relationships, among different variables. Explanatory research can also be carried out in order to examine the effects of particular changes on several processes and present norms (Singpurwalla, 2020). The emphasis of an explanatory research is to analyze a particular situation in order to describe the patterns of correlation between variables. The explanatory research design is therefore suitable given that the objective of this research is to analyze the relationship between warehouse optimization, firm size, and performance of distribution firms in Kenya.

3.3 Target Population

The target population is a collection of research components that refers to all members of an actual or imaginary group of people, events, or objects to whom the findings should be applied (Prabhat &Meenu, 2017). It can also be described as the set of sampling units or cases that the researcher is interested in. The target population, according to Kothari (2019), is a physical representation that contains all the units that could be members of the sample. A population can alternatively be thought of as the whole collection of elements from which the study wants to draw conclusions. Mugenda and Mugenda (2018) define a population as a group of people, objects,

persons or items from which a sample is extracted for analysis and to which generalization can be made of the whole population. In this study, the target population was distribution firms.

Distribution firms, encompassing clearing and forwarding firms as well as logistics companies, are identified as the target population. These firms were selected due to their central role in the supply chain, particularly in managing warehouse operations and optimizing logistical processes. The choice to focus on distribution firms is rooted in their significant impact on operational performance metrics, including inventory management, order fulfilment, and timely delivery. By examining warehouse optimization strategies within these firms, the study shed light on improving overall operational efficiency across the distribution sector. From data obtained from Kenya International Freight and Warehousing Association (KIFWA), there are a total of 1061 distribution firms listed in Appendix IV. The distribution firms formed the unit of analysis while warehouse managers formed the unit of observation. Warehouse managers were selected because they were directly involved with all warehouse optimization related activities in the distribution firms and are therefore in a position to provide the needed information on the effect of warehouse optimization on performance of distribution firms in Kenya.

3.4 Sampling Frame

A sampling frame describes a list of all the items from where a representative sample is drawn for the purpose of a study (Nachmias & Nachmias, 2018). It is a list of members of the research population from which a random sample may be drawn (Kothari & Garg, 2019). The sample frame for this study was compiled from list of 1061 distribution firms in Kenya.

3.5 Sampling Technique Sample Size

Sampling is the process of selecting a subset of individuals, events, or elements from a larger population to participate in a study (Burns & Grove, 2019). It is particularly appropriate when involving the entire population is impractical or impossible (Cooper & Schindler, 2019). In research, probability sampling refers to techniques where each

element of the population has a known and non-zero chance of being selected, allowing for the results to be generalized to the broader population and reducing the risk of selection bias (Saunders et al., 2019; Depoy & Gitlin, 2019; Sarantakos, 2018; Black, 2019). Common probability sampling methods include simple random sampling, stratified sampling, and systematic sampling, among others.

While simple random sampling ensures that each member of the population has an equal chance of being selected (Creswell, 2019; Shamoo & Resnik, 2018), it may not always be the most appropriate approach. In this study, the population consists of firms that vary in size, sub-sector, and geographical location. Because the hypotheses specifically examine the effects of firm size as a moderator, and firms differ across sub-sectors and counties, a stratified random sampling technique would have been more suitable. Stratified sampling involves dividing the population into distinct subgroups (strata) based on key characteristics, such as firm size, sub-sector, and county, and then randomly selecting participants from each stratum. This approach ensures that the sample adequately represents all relevant subgroups, allowing for more precise comparisons across categories and reducing sampling bias.

Using stratified random sampling would have improved the representativeness of the sample by guaranteeing that all critical population characteristics such as large, medium, and small firms in each sub-sector and region were proportionally included. This method not only strengthens the generalizability of the findings but also aligns the sampling strategy with the study's analytical objectives, particularly when assessing the moderating effect of firm size on the relationship between independent and dependent variables. Therefore, while simple random sampling minimizes some biases, the study's objectives would be better supported by a stratified probability sampling technique.

A sample is a representative of certain known percentage, frequency distributions of elements' characteristics similar to the corresponding distributions within the whole population (Kasomo, 2019). Kothari (2019) explains that a sample size refers to the number of items to be selected from the universe to constitute a sample while sampling

procedures refers to the technique used in selecting the items of the sample. The Yamane formula was adopted to calculate the study sample size as follows;

$$n = \frac{N}{1+N(e^2)}$$

Where n is the sample size, and N is the population size, e- acceptable sampling error (0.05)

$$= \frac{1061}{1+1061(0.05^2)}$$

$$= \frac{1061}{3.65} = 290.48$$

$n \approx 290$

Therefore, the study sample size was 290 respondents.

3.6 Data Collection Instruments

There are several ways of collecting data which differ considerably in terms of money costs, time and other resources at the disposal of the researcher (Orodho, 2018). The choice of data collection instrument is often very crucial to the success of a research and thus when determining an appropriate data collection method, one has to take into account the complexity of the topic, response rate, time and the targeted population (Mwangi, 2019). Different tools are used to collect different types of data. There is primary data that is collected directly from the respondents; it is information that has never been collected while there is secondary data collection tools that are used to collect secondary data. In this study, primary data was collected using a semi structured questionnaire because they are cost effective and convenient to collect and summarise responses (Zikmond, 2019). Kothari (2019) indicates that a questionnaire is a cost-efficient method to collecting information particularly from a huge group of respondents and it facilitates anonymity. Questionnaires consist of a series of specific, short questions that are asked verbally by the interviewer or answered by the respondents on their own (Bryman, 2019). According to Sekaran (2018), the questionnaire is advantageous since it covers a population in a short amount of time and at a low cost, and it increases the independence and accuracy of responses from

respondents. In addition, respondents are given a structured questionnaire, which was chosen since it provides a more thorough picture than any other research instrument. The questionnaire is developed in a systematic manner in accordance with the study objectives.

There are three basic types of questionnaires; close ended, open-ended or a combination of both. Close-ended questionnaires are used to generate statistics in quantitative research while open-ended questionnaires are used in qualitative research, although some researchers quantify the answers during the analysis stage (Dawson, 2018). This study used both closed-ended questions and open-ended questions to collect the data. Closed-ended questions were used where respondents were restricted to direct their answers without further explanation while the open-ended questions will seek respondent's views on variables being studied. The use of a semi structured questionnaire has also been adopted by Gitahi (2018), Sialala (2019) and Hassan (2019) in their studies.

The questionnaire includes Likert scale psychometric constructs with a scale ranging from 1-5 where each respondent was required to rate each and every statement given describing a given variable. The scale ranges from 5=Strongly Agree, 4=Agree, 3=No Opinion, 2= Disagree and 1=Strongly Disagree. At the end of each Likert scale questions, open ended questions are included to allow the respondent give additional information that is not captured in the Likert scales questions. This is the section that enabled the study to capture vital information directly from the respondents based on their understanding of warehouse optimization and performance of distribution firms in Kenya.

According to Russell, (2019), secondary data is helpful in research design of subsequent primary research as well as providing a baseline with which collected primary data can be compared to. Therefore, secondary data was obtained through the reports that would come from the procurement, warehouse, finance, logistics and distribution departments**.** Additionally, published journals provided necessary literature in this research.

3.7 Data Collection Procedures

According to Rotich (2019), data collection refers to gathering information to serve or prove some facts. For purposes of this study, data collection was done through the use of questionnaires. The questionnaire method has been selected because it is an unobtrusive and inexpensive method for data collection (Grønhaug, 2018). Based on the nature of the survey interaction, a questionnaire can be distributed to respondents using several modes: mail, telephone, internet, or face-to-face (Rotich, 2019). This study adopted the self-administered questionnaire approach. Self-administered questionnaires offer researchers the potential to reach a large number of potential respondents in a variety of locations (Cooper & Schindler, 2019). Gitahi (2018), Sialala (2018), and Hassan (2019) used self-administered questionnaires in their studies.

Before embarking on data collection, relevant approvals were obtained. An introductory letter from the JKUAT Nairobi campus introducing the researcher to relevant authorities for field data collection was first obtained. This letter was used to obtain the permit for research from the National Commission for Science, Technology, and Innovation (NACOSTI). In addition, the researcher sought permission from the respective firms to collect data in the organization. Follow-up calls and emails were then made to book an appointment.

During the appointment, the significance of the study was explained. The data collected from the field was done with the aid of three research assistants. It is expected that the use of the research assistants improved the return rate of the questionnaires since any clarifications on the questionnaire were made contemporaneously. The research assistants were trained on research ethics and on the research instrument and its administration, interview skills, and data recording. An introductory letter for the research assistant to collect data on the researcher's behalf was given to the research assistants.

3.8 Pilot Test

In social science research, the word "pilot test" has two meanings. It can refer to "feasibility studies," which are small-scale versions, or "trial runs," carried out in advance of a larger investigation (Polit & Beck, 2019). A pilot study, according to Kothari (2019), is an imitation and rehearsal of the main survey. A pilot study, on the other hand, might be used to test or try out a new research instrument (Gujarati, 2019). A pilot study could reveal areas where the major research project might falter, such as if research protocols aren't being followed or whether proposed methodologies or instruments are inadequate or overly complicated (Nassiuma, 2019). A pilot study of data collection instruments were conducted to check that the items in the questionnaire are stated clearly, have the same meaning for target respondents, and provide the researcher with an estimate of how long it took to complete the questionnaire. According to (Green, 2014) It is utilized to improve the validity and relevance to the study objectives.

The lessons learned for improving both research design and data collection processes should be stated openly in the pilot study report. Because the pilot study is considered an essential component of the study protocol (Yin, 2019), the lessons learned from it eventually reflected in the design of the protocol and content (Riege, 2019). A pilot study differs from a pre-test in that the results are utilized to refine the theoretical framework and are included in the case study research findings (Yin, 2019). As a result, it is critical to note that the results of this pilot study are not mixed with the results of the actual case study research, as the main objective of the pilot study was to test a hypothesis.

According to Singpurwalla (2019), a pilot study sample size should ideally be 1-10% of the study sample. Therefore, for the purpose of this study, the pilot study was conducted by purposively selecting 15 firms from the sample size representing 5%. These firms will not be part of the actual data collection. In choosing the respondents for pilot testing, the researcher based on the accessibility of the location as it was in rainy season. The questions that have errors, omissions, ambiguous and irrelevant were re-defined and the questionnaire content, structure, and sequence was structured

restructured to enhance the content validity and reliability. These improvements made the data collection instruments precise.

3.8.1 Validity

Validity is about the accuracy of the data obtained in the study in representing the variables of the study (Saunders, 2019). Creswell and Garrett (2018) defined validity as to how well an instrument measures what it is intended to measure. The study used open-ended and close-ended questionnaires with Likert scale; another important feature is the population for which the measure is intended, once some of these decisions are made and a measure was developed.

Taherdoost, (2019) and Seltman, (2019) demonstrated that there are four types of validity: face validity, criterion validity, and content validity and construct validity. According to Lawoko, (2019), face validity, aims at checking whether from the surface; the concept looks valid or not. Criterion validity on the other hand aims to establish whether in the actual study there is good knowledge of theory relating to the concept while content validity is looking at the content of items to determine if they really measure the concept being measured in the study. In content validity, the researcher is required to make extensive search for the literature from theories, previous instruments, models and past research findings on the concepts related to the field of study (Seltman, 2018). According to Lawoko, (2019) construct validity measures the extent to which an instrument accurately measures a theoretical construct that it's designed to measure, after which exploratory Factor Analysis (EFA) is used to validity.

With the support of university supervisors and pilot testing, this study verifies the validity of the research instrument. To guarantee that the items in the questionnaire yielded reliable data, the following methods were implemented in this study. Expert opinion: supervisors' comments were incorporated into the instruments to improve their validity; a pre-test study was conducted among the warehouse managers on the effect of warehouse optimization on performance of distribution firms in Kenya.

Factor analysis: A validity test was performed on the research instrument, and the components were extracted using the Principal Component Analysis (PCA) method. For research with a sample size of less than 200, factor loadings greater than 0.40 are deemed statistically significant (Chou, 2016).

3.8.2 Reliability

Reliability refers to the consistency and stability of a research instrument over time. A reliable instrument consistently measures the same construct in the same way under similar conditions. In other words, if the research instrument were administered multiple times to the same sample, it should yield similar results (Hair *et al*., 2019). Reliability is critical for ensuring that the findings of the study are not influenced by errors or inconsistencies in the data collection process. There are various types of reliability, including internal consistency, test-retest reliability, and inter-rater reliability, all of which focus on different aspects of consistency (Mugenda & Mugenda, 2019).

In this study, the reliability of the research instrument (the structured questionnaire) was tested using Cronbach's Alpha coefficient, a widely used statistical method to assess internal consistency. Internal consistency refers to the extent to which all items on a scale measure the same concept or construct. Cronbach's Alpha provides a coefficient value between 0 and 1, where a higher value indicates greater reliability. Generally, a Cronbach's Alpha value of 0.7 or higher is considered acceptable, indicating that the items on the questionnaire are consistently measuring the same underlying factor.

3.9 Data Analysis and Presentation

The researcher collected questionnaires, code them, and enter them into the Software Package for Social Sciences (SPSS version 26) for analysis. The sort function was used to perform the initial screening. The data was based on the study's objectives and research hypothesis. The descriptive statistical techniques of frequency, mean, and standard deviation were used to analyze the quantitative data acquired. The results were displayed using frequency distribution tables, which kept track of how many

times a score or response appears. Qualitative data collected was analysed using content analysis and presented in prose form.

Inferential statistics including regression and correlation analysis were used in the study. According to Saunders *et al.* (2019), correlation is a statistical tool that helps to determine the relationships between two or more variables. Cooper and Schindler (2019) indicate that correlation, as measured by a correlation coefficient, is the degree to which a linear predictive relationship exists between random variables. Pearson correlation coefficient was used for testing associations between the independent and the dependent variables. According to Wagana (2018), a correlation coefficient (r) has two characteristics, strength and direction. The strength of the relationship is indicated by how r tends toward 1, the maximum value possible. r is interpreted as follows; when r = +1 it means there is perfect positive correlation between the variables, when r = 0 it means there is no correlation between the variables, that is the variables are uncorrelated, when r = -1 it means there is perfect inverse correlation between the variables.

A multiple regression model was used to test the significance of the influence of the independent variables on the dependent variable. Multiple regression analysis was used to determine how warehouse optimization influence performance of distribution firms in Kenya. Regression analysis attempts to determine whether a group of variables together predict a given dependent variable and, in this way, attempts to increase the accuracy of the estimate (Mugenda & Mugenda, 2019). The use of regression model is ideal due to its ability to show whether a positive or a negative relationship exists between independent and dependent variables (Mason, Lind, & Marchal, 2018). Previous studies have used multiple regression models with satisfactory results in studies on the influence of project governance on project performance include; (Musawir, Serra, Zwikael & Imran, 2019; Joslin & Müller, 2019); Pinyarat et al., 2019; Ihab, 2018; Asadullah *et al.*, 2019).

Statistical Model

The multiple regression equation model is illustrated below: -

$Y= \beta_0+ \beta_1X_1+\beta_2X_2+ \beta_3X_3+ \beta_4X_4+e$

Where:

Y is the dependent variable (performance of distribution firms in Kenya),

β_0 is the constant (Co-efficient of intercept)

β_1, β_2, β_3, and β_4 are beta coefficients,

X_1 is product placement,

X_2 is warehouse flow,

X_3 is retrieval systems,

X_4 is warehouse layout while

e is an error term

Moderator is a variable that affects the direction and the strength of the relationship between an independent or predictor variable and a dependent criterion variable (Baron & Kenny, 2019). This variable may reduce or enhance the direction of the relationship between a predictor variable and a dependent variable, or it may change the direction of the relationship between the two variables from positive to negative (Baron & Kenny, 2016; Lindley & Walker, 2019). The moderating variable in the study is the firm size on the independent variable and the outcome variable.

Hierarchical multiple regression was utilized to evaluate the moderating influence of firm size on the relationship between warehouse optimization and performance of distribution firms in Kenya. This helped to decide whether to accept or reject hypotheses. In this study, the test for moderation entails examining the interaction impact between warehouse optimization and performance of distribution firms in Kenya and assessing the significance or insignificance of the resulting effect. This study used multiple regressions analysis (stepwise method) to establish the moderating effect of firm size (Z) on relationship between warehouse optimization and performance of distribution firms in Kenya. Model 1.2 was used to test the joint moderating effect.

$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta zZ + \beta izXiZ + \varepsilon$, (i=1, 2, 3, 4)…....…….....1.2

X_iZ_i is the interaction between the moderator (firm size with each of the independent variables (X_1, X_2, X_3, X_4).

BZi is the coefficient of X*Z the interaction term between the moderator and each of the independent variables for i = 1,2,3,4;
β_0 is constant (Y- intercept) which represent the value of Y when X =0

3.9.1 Diagnostic Tests

When the assumptions of the linear regression model are correct, ordinary least square (OLS) provides efficient and unbiased estimates of the parameters (Long & Ervin, 2019). Independent variables were subjected to the following tests: linearity, multicollinearity, normality, homoscedasticity before regression analysis was conducted.

Linearity Test

For linear regression, the association existing between the response and the predictor variables should be linear. It's very crucial that the study checks for outliers because linear regression is sensitive to the effects of outlier (Creswell, 2019). The study used scatter plots to test whether the assumption has been met. If the plot, follow a linear pattern when plotted on the x and y axis the assumption will have been met.

Multicollinearity Test

Multicollinearity was addressed using the Variance Inflation Factor (VIF) on the variance of the estimators. This is expressed as $VIF = 1/(1-R^2)$. The general rule is that values greater than ten suggest presence of multicollinearity (Chatterjee & Hadi, 2019). If multicollinearity is detected, the remedy was to collect more data or drop off some of the correlated variables. The key limitation of multicollinearity is that it can yield to unstable regression coefficients characterized by large standard errors and high variances, which can then lead to inaccurate statistical inferences (Bergmann & Hohenboken, 2019).

Normality Test

To test for normality assumptions, the study adopted improved Shapiro-Wilk test. The improved Shapiro-Wilk test is a test for normality in regression studies which is normally preferred because of its superb power properties (Mendes & Pala, 2019). The

test basically yields a value W which lies between zero and one. A value of one indicates normality whereas weak values indicate a departure of normality (Nornadiah & Yap, 2019). This study in principle, stuck to this stated convention of interpreting normality.

Heteroscedasticity

Heteroscedasticity in a study usually happens when the variance of the errors varies across observation, (Long & Ervin, 2019). Breusch-Pagan and Koenker test was used to test the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables. Breusch-Pagan and Koenker test the null hypothesis that heteroskedasticity not present (homoskedasticity) if sig-value is less than 0.05, reject the null hypothesis. A large chi-square value greater than 9.22 would indicate the presence of heteroscedasticity (Sazali, Hashida, Jegak & Raduan, 2019).

3.9.2 Operationalization of the study Variables

This study tested the validity of the multi regression models using ANOVA and F distribution as proposed by (Mason *et al.,* 2019). ANOVA is also the data analysis procedure that is used to determine whether there are significant differences between two or more groups or samples at a selected probability level (Mugenda & Mugenda, 2018). To test the significance of regression coefficient, T test will be performed (Mason *et al*., 2019). The study performed individual tests of all independent variables to determine which regression coefficient may be zero and which one may not. The conclusion was based on the basis of p value where if the null hypothesis of the beta is rejected then the overall model is significant and if null hypothesis is not rejected the overall model is insignificant. In other words if the p-value is less than 0.05 then the researcher concluded that the overall model is significant and has good predictors of the dependent variable and that the results are not based on chance. If the p-value is greater than 0.05 then the model is not significant and cannot be used to explain the variations in the dependent variable. The decision rule is summarized in Table 3.1

Table 3.1: Hypotheses Test

Hypotheses statement	Hypothesis test	Decision rule
H_{01}: Product placement has no significant effect on performance of distribution firms in Kenya	Karl-Pearson's coefficient of correlation -F-test (ANOVA) -T-test	Reject H01 if P-value ≤ 0.05 otherwise fail to reject H01 if P is > 0.05
H_{02}: Warehouse flow does not significantly affect performance of distribution firms in Kenya	Karl-Pearson's coefficient of correlation -F-test (ANOVA) -T-	Reject H02 if P-value ≤ 0.05 otherwise fail to reject H02 if P is > 0.05
H_{03}: Retrieval systems has no significant effect on performance of distribution firms in Kenya	Karl-Pearson's coefficient of correlation -F-test (ANOVA) -T-test	Reject H02 if P-value ≤ 0.05 otherwise fail to reject H03 if P is > 0.05
H_{04}: Warehouse layout does not significantly affect performance of distribution firms in Kenya	Karl-Pearson's coefficient of correlation -F-test (ANOVA) -T-test	Reject H04 if P-value ≤ 0.05 otherwise fail to reject H04 if P is > 0.05
H_{05}: Firm size has no significant moderating effect on the relationship between warehouse optimization and performance of distribution firms in Kenya	Karl-Pearson's coefficient of correlation -F-test (ANOVA) -T-test	Reject H05 if P-value ≤ 0.05 otherwise fail to reject H05 if P is > 0.05

3.10 Ethical Consideration

Legal considerations are mandatory guidelines that a researcher is expected to adhere to before collecting data or conducting a study. The researcher obtained a data collection letter from JKUAT). Using the data collection letter from the University, the researcher requested for a data collection permit from the National Commission for Science, Technology and Innovation (NACOSTI).

Ethical considerations refer to the legal or acceptable codes of conduct that the researcher considered when conducting this study (McNabb, 2019). The researcher ensured respect of human dignity, beneficence and justice, which are the principles of an acceptable code of conduct in any business endeavor. Information consent involves

understanding and voluntary agreement to take part in a research project (Kara, 2019). The respondents were asked whether they are willing to participate in this study since the principle of sensitivity were observed. Only the respondents who were willing to participate in the study were given the questionnaires to fill.

To ensure confidentiality, the participants got assurance from the researcher that any information they provided during this study would be regarded with utmost confidentially, and that it would be used for learning purposes. To ensure privacy, the researcher stored the data documents in a secure location and restrict access to the data documents to only selected individuals. To enhance anonymity, the participants were requested not to indicate their personal contacts or their names when filling out the questionnaires.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The chapter entails analysis of data, presentation and interpretation of the findings and discussion as regards the objective of this study. The purpose of the study was to establish the effect of warehouse optimization on performance of distribution firms in Kenya. The first section in this chapter is the questionnaire's response rate. This is followed by the presentation of the results of pilot test results and background information of the respondents. The fourth section presents the descriptive results of the dependent variable, independent variables and the moderating variable. The fifth section details result on the inferential statistics covering diagnostic tests, correlation analysis, multiple regression, and univariate regression analysis as well as moderating effect analysis. The results are presented in tables and figures and prose form for the open-ended questions.

4.2 Response Rate

The sample size for the study was 290 warehouse managers of distribution firms in Kenya. The selected sample was issued with questionnaires to help establish the effect of warehouse optimization on performance of distribution firms in Kenya. The returned questionnaires were crosschecked for accuracy and completeness and 247 were found to be valid and reliable and could be used for further analysis and reporting. The returned questionnaires formed a response rate of 85.2% as shown in Table 4.1. As explained by Sekaran and Bougie (2020), a response rate of 50% and above is adequate for analysis, 60% and above is good while that of 70% and above is excellent. Therefore, the response rate of 85.2% was excellent for further analysis and reporting.

Table 4.1: Response Rate

Questionnaire	Frequency	Percent
Responsive	247	85.2
Non responsive	43	14.8
Total	290	100.0

4.3 Pilot Test Results

According to Muchele and Kombo (2019), a sample size of between 1% to 10% is sufficient for a pilot test. Therefore, the study targeted 15 warehouse managers for a pretest using a questionnaire. The aim of this pretest, as described by Lawoko (2019), was to assess the questionnaire's comprehensibility, logic, content, wording, layout, and relevance to ensure that it was valid, reliable, and error-free. The data collected from the pilot test was used to establish and evaluate the validity and reliability of the data collection instrument (questionnaire) to measure the relationship between warehouse optimization and the performance of distribution firms in Kenya.

4.3.1 Reliability of the Research Instrument

According to Muchele and Kombo, (2019), reliability of a data collection instrument refers to the extent to which test scores are free from measurement error. In this study, Cronbach's Alpha coefficient was used to measure the reliability of the instrument. Lawoko, (2019) expounds that Cronbach's alpha coefficient ranges between 0 and 1. All items that returned a Cronbach's alpha coefficient of 0.7 or more were considered reliable. From the findings in Table 4.2, all Cronbach Alpha Values for product placement, warehouse flow, retrieval systems, warehouse layout, firm size, and performance of distribution firms are more than 0.7. This was a demonstration that the instrument for data collection was reliable.

Table 4.2: Summary Reliability Results

Variable	Cronbach's Alpha	Number of questions	Decision	Conclusion
Product placement	0.921	9	> 0.7	Reliable
Warehouse flow	0.733	9	> 0.7	Reliable
Retrieval systems	0.801	9	> 0.7	Reliable
Warehouse layout	0.800	9	> 0.7	Reliable
Firm size	0.784	9	> 0.7	Reliable
Performance of Distribution firms	0.811	7	> 0.7	Reliable

4.3.2 Validity of the Research Instrument

Seltman (2018) suggests that an instrument is valid when it accurately measures any prescribed variable. According to Lawoko, (2019) construct validity measures the extent to which an instrument accurately measures a theoretical construct that it's designed to measure, after which exploratory Factor Analysis (EFA) is used to validity. The Exploratory Factor Analysis has been defined as a technique used to explore the interrelationships among a set of variables by using the principal components analysis (PCA) (Lawoko, 2019). The threshold for good construct validity is 0.4 as suggested by Seltman, (2019). From the findings presented in Appendix III, all the variables were found to have values greater than 0.4 and indication that they were all valid.

4.4 Demographic Characteristics Analysis

In this section, the study presents findings on the demographic information of study respondents that was sought. The study specifically sought to determine their highest level of education, and length of service in the organization. The findings were as presented and discussed in sub-sections below.

4.4.1 Respondents Highest Level of Education

The study sought to establish how educated the selected warehouse managers were. From the findings in Figure 4.1, 10.2% of the respondents held PhD as their highest level of education, 24.6% had Master's, majority, 44.6%, held bachelor's degree. In addition, 15.5% and 5.1% of the respondents held diploma and certificate respectively.

This shows diversity in managers' level of education however majority held high level of education. This aligns with literature on management education by Mintzberg (2023) which has shown that while higher education qualifications, such as masters and doctoral degrees, can enhance managerial skills and knowledge, there is no single, prescribed educational path to success in management roles. Additionally, the presence of warehouse managers with diploma and certificate qualifications emphasizes the importance of practical and vocational education in preparing individuals for leadership roles within specific industries (Boyatzis, 2024).

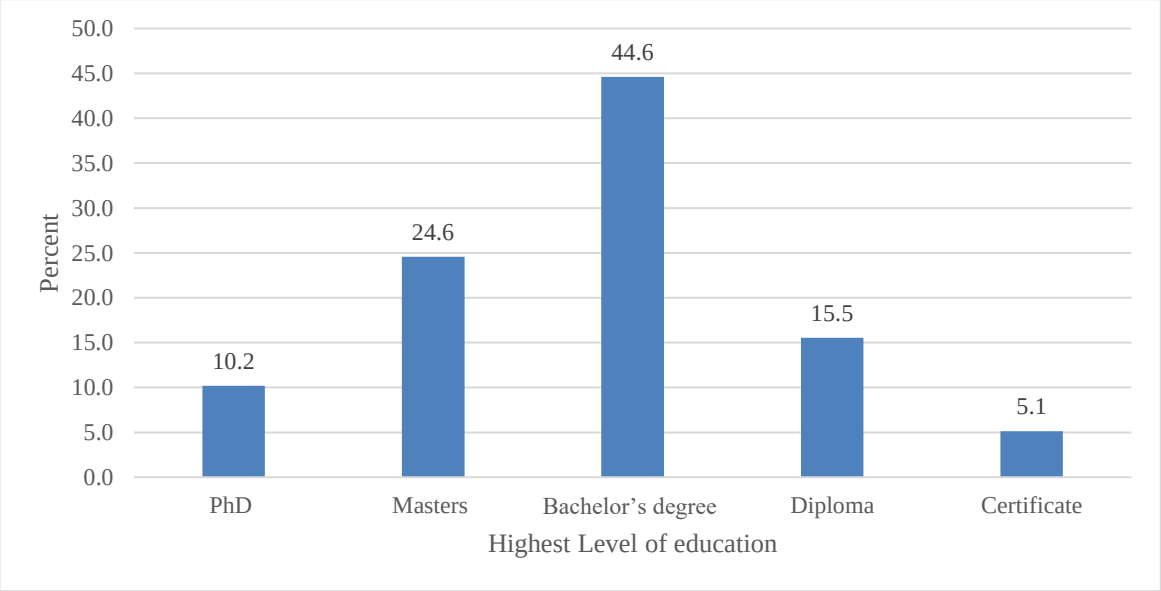

Figure 4. 1: Respondents Highest Level of Education

4.4.2 Respondents Length of service in the Organization

Respondents were asked to indicate the length of time they have stayed at the organization. The findings were as presented in Figure 4.2. From the findings, 44.4% had worked for 4-10 years, 30.3% for less than 4 years while 25.3% for more than 10 years. These results indicate a varied distribution of organizational tenure among warehouse managers. A substantial proportion, 44.4%, have been with their organizations for a duration ranging from 4 to 10 years, suggesting a significant mid-term commitment to their roles. This aligns with research in organizational behavior, which often associates this tenure range with a period of career stability and professional growth (Cascio, 2023). Additionally, 25.3% of respondents have

remained with their organizations for more than 10 years, reflecting a longer-term commitment that may signify experience and organizational loyalty (Meyer & Allen, 2023). The presence of individuals less than 4 years of tenure is consistent with observations that some management positions, including those in warehousing, may see varying levels of turnover due to factors such as industry-specific challenges and opportunities (Nguyen et al., 2018).

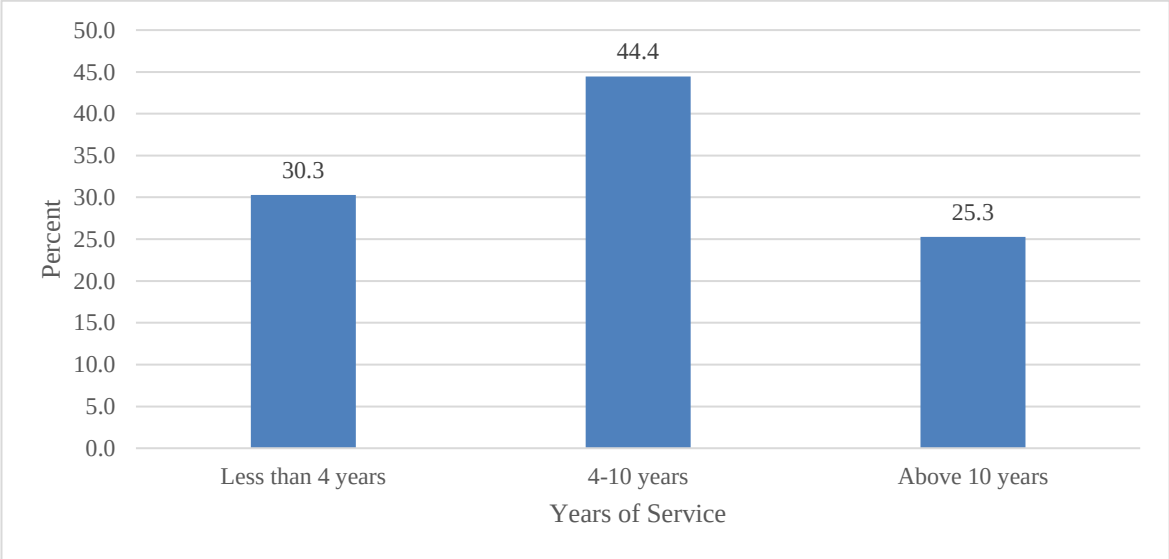

Figure 4.2: Respondents Length of service in the Organization

4.4.3 Size of the Organization

As part of the demographic information, the respondents were requested to indicate the size of their organization. The results were as shown in Figure 4.3. From the results, 42.7% of the respondents described their organization medium size, 29.8% of the respondents indicated small size while 27.5% of the respondents described their organization as large size. Zhang et al. (2018) and Vassiliadis et al. (2020), suggest that larger organizations often have more resources to invest in advanced warehouse management systems (WMS), automation, and dedicated logistics teams, leading to better performance outcomes. In contrast, medium-sized and small organizations, may face resource limitations but can still optimize warehouse operations through process improvements, staff training, and lean practices, as discussed by Jahanshahi et al. (2023) and Kuk et al. (2019). This indicates that while larger firms may benefit from

more advanced solutions, smaller firms can still achieve significant performance improvements by adopting tailored, resource-efficient strategies.

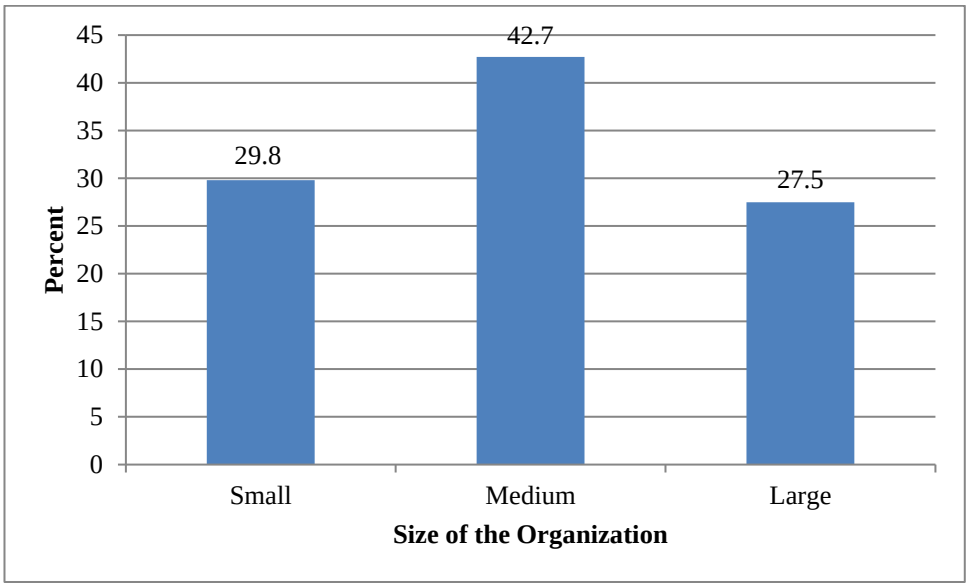

Figure 4. 3: Size of the Organization

4.5 Descriptive Analysis of Study Variables

In this section the study presents findings on Likert scale questions where respondents were asked to indicate their level of agreement with various statements that relate with the effect of warehouse optimization on performance of distribution firms in Kenya. They used a 5-point Likert scale where 1-strongly disagree, 2-disagree, 3-neutral, 4-agree, 5-strongly agree. The means and standard deviations were used to interpret the findings where a mean value of 1-1.4 was strongly disagree, 1.5-2.4 disagree, 2.5-3.4 neutral, 3.5-4.4 agree and 4.5-5 strongly agree. Also, respondents were asked open ended questions at the end of the Likert questions that helped capture information that was not captured by the Likert questions. The standard deviation was also used to interpret the results, where a standard deviation greater than 2 indicated high variability among responses. This suggests that participants had diverse views or differing interpretations of the statements presented. The information was analysed using content analysis and presented in prose form.

4.5.1 Product Placement

The first objective of the study was to establish the effect of product placement on performance of distribution firms in Kenya. Respondents were therefore requested to indicate their level of agreement with statements on product placement. Table 4.3 presents summary of the findings obtained. From the results, the respondents agreed that in their organization, high-demand products are positioned closer to the dispatch area to reduce travel time during order picking (M= 3.784, SD= 0.974). In addition, the respondents agreed that in their organization, bulky or oversized items are assigned specific storage zones to avoid congestion in the warehouse (M= 3.714, SD= 0.772). Further, respondents agreed that in their organization, the warehouse layout considers product compatibility to reduce picking errors and improve order accuracy (M= 3.691, SD= 0.898). The respondents also agreed that in their organization, the warehouse layout is regularly adjusted based on changes in product pick frequency, (M= 3.630, SD= 0.791). The study findings are in line with the findings of Aghbar and Al-Qaseem (2024) emphasize that high-frequency items should be placed near the dispatch or picking zones to minimize travel time and improve order throughput. Similarly, Warsewicz and Kulykovets (2023) argue that adjusting the warehouse layout to reflect item demand leads to faster picking processes and reduced labor costs, thereby optimizing warehouse performance.

The respondents agreed that in their organization, incompatible products are stored in separate areas to prevent damage or contamination (M= 3.642, SD= 0.718). In addition, the respondents agreed that in their organization, frequently picked items are placed in easily accessible locations within the warehouse (M= 3.583, SD= 0.992). Further, respondents agreed that in their organization, products are stored based on their size and weight to ensure safety and ease of access (M= 3.571, SD= 0.742). The respondents also agreed that in their organization, compatible products are grouped together in storage to streamline the picking and packing process, (M= 3.574, SD= 0.888). From the results, the respondents agreed that in their organization, heavy items are placed at lower storage levels to reduce handling risks and improve picking efficiency (M= 3.539, SD= 0.891). The study results are in line with the findings of Kumar (2017) who that heavy items should be stored at lower levels to reduce the risk

of injury and improve ergonomics during handling. In line with this, Kibet, Wachiuri and Senelwa (2024) notes that categorizing items by volume and weight enhances picking efficiency and allows better use of warehouse space, especially in high-density storage environments. Warsewicz and Kulykovets (2023) found that grouping compatible items in the same storage zone reduces picking errors and enhances order accuracy.

Table 4.3: Descriptive statistics on Product Placement

Statements.	**1** %	**2** %	**3** %	**4** %	**5** %	**Mean**	**Std. Dev**
Pick Frequency							
In our organization, frequently picked items are placed in easily accessible locations within the warehouse.	2.3	17.1	9.7	61.7	9.1	3.583	0.992
In our organization, the warehouse layout is regularly adjusted based on changes in product pick frequency.	3.7	11.7	17.9	51.2	15.4	3.630	0.791
In our organization, high-demand products are positioned closer to the dispatch area to reduce travel time during order picking.	2.1	4.2	20.0	60.5	13.2	3.784	0.974
Size and Weight							
In our organization, products are stored based on their size and weight to ensure safety and ease of access.	4.0	12.1	21.0	48.7	14.3	3.571	0.742
In our organization, heavy items are placed at lower storage levels to reduce handling risks and improve picking efficiency.	4.8	9.6	21.0	56.3	8.4	3.539	0.891
In our organization, bulky or oversized items are assigned specific storage zones to avoid congestion in the warehouse.	0.5	9.4	24.5	49.5	16.1	3.714	0.772
Product Compatibility							

Statements.	1 %	2 %	3 %	4 %	5 %	Mean	Std. Dev
In our organization, compatible products are grouped together in storage to streamline the picking and packing process.	2.6	9.7	23.6	55.9	8.2	3.574	0.888
In our organization, incompatible products are stored in separate areas to prevent damage or contamination.	3.1	12.4	19.7	46.6	18.1	3.642	0.718
In our organization, the warehouse layout considers product compatibility to reduce picking errors and improve order accuracy.	1.5	9.3	20.1	56.9	12.3	3.691	0.898
Aggregate Score						**3.636**	**0.852**

4.5.2 Warehouse Flow

The second objective was to assess the effect of warehouse flow on performance of distribution firms in Kenya. Respondents were therefore asked to indicate their level of agreement with statements on warehouse flow which was measured in terms of dispatching, returns, and order picking. Table 4.4 below presents summary of the findings obtained. Regarding dispatching, the respondents agreed on average that a process flow illustrates how goods are received, the process they go through, how they are shipped, and any stages in between (M= 3.712, SD= 0.845); that their organization has a visual chart or diagram that shows the main activities of the warehouse (M= 3.671, SD= 0.873); and that they are satisfied with the procedure followed when dispatching delivery goods in their organization (M= 3.500, SD= 0.731). They also agreed on returns that they satisfied with the effectiveness of warehouse returns in their organization (M= 3.749, SD= 0.885); that their organization ensures there is free flow of goods and services to enhance warehouse operations (M= 3.710, SD= 0.779); and that their organization has a specialized team to ensure effective warehouse performance (M= 3.646, SD= 0.782).

Based on the findings above, it is evident that the respondents agree that dispatching, returns, and order picking affect performance of distribution firms in Kenya. This is

also supported by an aggregate mean of 3.655 (SD= 0.828). The study findings regarding the significance of dispatching and order picking resonates with Hernandez and Muller (2021) research on the influence of warehouse management on organizational productivity. They found that factors such as distribution planning and stock control significantly contribute to organizational productivity. Also, Mensah (2020) study on the effect of warehousing practices on organizational performance also supports your findings. They found that warehouse dimensions, including order picking, have a positive and significant relationship with organizational performance. This study's emphasis on order picking as a factor affecting distribution firm performance aligns with their research. The study by Mutai and Moronge (2023) on the impact of integrated warehouse operation efficiency on organizational performance strengthens study findings. They found a high-quality relationship between warehouse operation efficiency and organizational performance. The studies align with present study findings as they collectively emphasize the importance of efficient warehouse processes in enhancing organizational performance.

Table 4.4: Descriptive Statistics on Warehouse Flow

	1 %	**2** %	**3** %	**4** %	**5** %	**Mean**	**Std. Dev**
Dispatching							
Our organization has a visual chart or diagram that shows the main activities of the warehouse	4.0	8.1	18.5	55.5	13.9	3.671	0.873
A process flow illustrates how goods are received, the process they go through, how they are shipped, and any stages in between	3.1	5.2	23.6	53.4	14.7	3.712	0.845
Am satisfied with the procedure followed when dispatching delivery goods in our organization	0.6	17.7	23.2	48.2	10.4	3.500	0.731
Returns							
Our organization ensures there is free flow of goods and services to enhance warehouse operations	2.9	10.6	17.9	49.8	18.8	3.710	0.779
Our organization has a specialized team to ensure effective warehouse performance	5.0	9.3	18.6	50.3	16.8	3.646	0.782

	1 %	2 %	3 %	4 %	5 %	Mean	Std. Dev
Am satisfied with the effectiveness of warehouse returns in our organization	1.0	12.8	13.3	55.9	16.9	3.749	0.885
Order picking							
Order picking is a key component of warehouse flow	0.6	18.8	13.0	58.4	9.1	3.565	0.925
In our organization there is a procedural way of picking orders	4.5	6.2	18.0	55.6	15.7	3.719	0.882
Am satisfied with the effectiveness of order picking methods in our organization	0.6	14.2	21.9	49.0	14.2	3.619	0.749
Aggregate Score						**3.655**	**0.828**

4.5.3 Retrieval Systems

The third objective of the study was to determine the effect of retrieval systems on performance of distribution firms in Kenya. Respondents were asked to indicate their level of agreement with statements on retrieval systems. The study adopted information systems, input systems, and output system as measures of retrieval systems. Table 4.5 presents summary of the findings obtained.

Regarding information systems, respondents agreed on average that their organization has adopted information system for storage of information (M= 3.751, SD= 0.807); that in their organization there is less paperwork hence efficiency of operations (M= 3.690, SD= 0.918); and that they are satisfied with the effectiveness information systems in their organization (M= 3.617, SD= 0.776). On input systems, respondents agreed that in their organization information is stored systematically (M= 3.732, SD= 0.909); that they are satisfied with the effectiveness input systems in their organization (M= 3.686, SD= 0.728); and that output system is a key component of retrieval system in their organization (M= 3.610, SD= 0.810). Finally on output system, respondents agreed that they are satisfied with the effectiveness of output system in their organization (M= 3.811, SD= 0.856); that retrieval of information in their organization is done systematically (M= 3.794, SD= 0.939); and that output system is a key component of retrieval system in their organization (M= 3.610, SD= 0.810).

Based on the findings above, it is evident that information systems, input systems, and output system affects performance of distribution firms in Kenya. As supported by an aggregate mean of 3.702 (SD= 0.847) it is evident that retrieval systems affects performance of distribution firms in Kenya. The study findings align with the study by Clough and Sanderson (2016) who emphasized the importance of information retrieval systems in information management. They indicate that effective information systems positively affect performance. It also aligns with literature by Kim and Alvarez (2021) that discussed the role of information and communication technology (ICT) in information retrieval systems. It also aligns with the study by Okafor (2020) that delved into knowledge storage and retrieval's impact on employee performance. Efficient output systems often lead to improved decision-making processes. Eder (2022) also emphasized the role of retrieval systems in overall efficiency. The findings on information systems, input systems, output systems, and retrieval systems align with the literature, emphasizing their critical roles in enhancing efficiency, information management, decision-making, and ultimately, the performance of distribution firms in Kenya. These systems are integral components of modern distribution operations and significantly impact their overall effectiveness and competitiveness in the market.

Table 4.5: Descriptive Statistics on Retrieval Systems

Statements	1 %	2 %	3 %	4 %	5 %	Mean	Std. Dev
Information Systems							
Our organization has adopted information system for storage of information	0.5	14.1	14.6	51.2	19.5	3.751	0.807
In our organization there is less paperwork hence efficiency of operations	1.5	7.4	22.7	57.6	10.8	3.690	0.918
Am satisfied with the effectiveness information systems in our organization	4.6	12.6	16.0	50.3	16.6	3.617	0.776
Input Systems							
Input systems is a key component of retrieval systems	4.2	4.8	25.5	55.2	10.3	3.624	0.880
In our organization information is stored systematically	1.2	13.4	12.2	57.3	15.9	3.732	0.909
Am satisfied with the effectiveness input systems in our organization	1.2	12.2	21.5	47.1	18.0	3.686	0.728
Output system							
Output system is a key component of retrieval system in our organization	4.2	8.9	21.6	52.1	13.1	3.610	0.810

Am satisfied with the effectiveness of output system in our organization	3.3	8.3	13.9	52.8	21.7	3.811	0.856
Retrieval of information in our organization is done systematically	2.8	9.9	10.6	58.2	18.4	3.794	0.939
Aggregate Score						**3.702**	**0.847**

4.5.4 Warehouse Layout

The fourth objective of the study was to find out the effect of warehouse layout on performance of distribution firms in Kenya. Respondents were requested to indicate their level of agreement with the statements on warehouse layout which was measured in terms of type of layout that is distribution center layout, fulfilment center layout, and cross-docking facility layout. Table 4.6 presents summary of the findings obtained.

Regarding distribution center layout, the findings showed that the respondents agreed that the layout of their distribution center: effectively optimizes space utilization and facilitates efficient movement of goods (M= 3.848, SD= 0.947); that it is conducive to streamlined inventory management processes, minimizing congestion and enhancing workflow efficiency (M= 3.837, SD= 0.891); and that it supports easy accessibility to inventory, enabling quick retrieval and loading of goods for outbound shipments (M= 3.743, SD= 0.734). On fulfilment center layout, respondents agreed that the layout of their fulfilment center: contributes significantly to the accuracy and timeliness of order fulfilment processes (M= 3.794, SD= 0.882); that it is designed to minimize order processing errors and enhance overall customer satisfaction (M= 3.727, SD= 0.764); and that it enables efficient picking, packing, and shipping of orders, leading to improved operational performance (M= 3.603, SD= 0.799). Finally on cross-docking facility layout, they agreed that their cross-docking facility layout: supports swift and seamless transfer of goods between inbound and outbound shipments (M= 3.818, SD= 0.947); that it enhances operational agility and responsiveness to changing customer demands (M= 3.732, SD= 0.778); and that it is optimized to minimize handling and storage times, resulting in improved efficiency and cost-effectiveness (M= 3.600, SD= 0.934).

The findings above show that space utilization, volume of goods stored, and labour productivity affect performance of distribution firms in Kenya. This also means that

warehouse layout affects performance of distribution firms in Kenya. This is supported by an aggregate mean of 3.745 (SD= 0.853). These findings resonate with study conducted by Ernawati, *et al* (2022) that underscored the paramount importance of optimizing warehouse space usage. They emphasize that an efficient warehouse layout contributes to streamlining processes, reducing production times, and gaining better visibility into operational challenges. Additionally, Kibet, Wachiuri and Senelwa (2024) explored the correlation between warehouse efficiency and layout, underlining that a well-thought-out layout positively affects operational efficiency. This is particularly relevant to our finding that warehouse layout affects distribution firm performance. Moreover, Buzu's study in 2021 focused on the impact of warehousing management on warehouse performance. It investigated various factors, including space utilization, storage, put away processes, and order picking – all of which are interconnected aspects of warehouse management. The study findings reveal that these processes significantly influence overall warehouse performance. This aligns perfectly with our findings that space utilization, volume of goods stored, and labor productivity collectively affect distribution firm performance.

Table 4.6: Descriptive Statistics on Warehouse Layout

	1 %	**2** %	**3** %	**4** %	**5** %	**Mean**	**Std. Dev**
Distribution Center Layout							
The layout of our distribution center effectively optimizes space utilization and facilitates efficient movement of goods	3.0	7.6	11.1	58.1	20.2	3.743	0.734
The distribution center layout is conducive to streamlined inventory management processes, minimizing congestion and enhancing workflow efficiency	1.0	6.4	18.7	55.7	18.2	3.837	0.891
Our distribution center layout supports easy accessibility to inventory, enabling quick retrieval and loading of goods for outbound shipments	1.1	11.8	19.8	46.5	20.9	3.848	0.947
Fulfilment Center Layout							
The layout of our fulfillment center contributes significantly to the accuracy and timeliness of order fulfillment processes	4.8	15.3	11.6	51.3	16.9	3.794	0.882
Our fulfillment center layout is designed to minimize order	0.5	13.4	18.0	49.0	19.1	3.727	0.764

processing errors and enhance overall customer satisfaction							
The layout of our fulfillment center enables efficient picking, packing, and shipping of orders, leading to improved operational performance	1.1	10.3	14.9	55.4	18.3	3.603	0.799
Cross-Docking Facility Layout							
Our cross-docking facility layout supports swift and seamless transfer of goods between inbound and outbound shipments	2.7	13.0	15.7	58.9	9.7	3.818	0.947
The layout of our cross-docking facility enhances operational agility and responsiveness to changing customer demands	3.3	9.8	17.5	49.2	20.2	3.732	0.778
Our cross-docking facility layout is optimized to minimize handling and storage times, resulting in improved efficiency and cost-effectiveness	4.0	5.1	14.2	58.5	18.2	3.600	0.934
Aggregate Score						**3.745**	**0.853**

Respondents were also asked to provide other ways they think warehouse layout affects performance of distribution firms in Kenya. Several respondents highlighted the significance of inventory management within the context of warehouse layout. One respondent noted, *"The way goods are organized and stored in the warehouse directly impacts how quickly we can locate and retrieve products. If there's a disorganized layout, it slows down our order fulfillment process."* This sentiment aligns with literature by Saifudin, Zainuddin and Azwardi (2023) emphasizing that an orderly and efficient layout can streamline inventory management, leading to improved distribution firm performance. Furthermore, some respondents pointed out the importance of material handling in relation to warehouse layout. One respondent remarked, "*The layout should be designed to minimize the distance our workers need to travel within the warehouse to retrieve or store goods. This reduces physical strain and enhances productivity."* This perspective resonates with Saifudin, Zainuddin and Azwardi, (2017) emphasizing that an optimized layout can enhance labor productivity and minimize the risk of workplace injuries, which are crucial factors in distribution firm performance.

Respondents also drew attention to the flow of goods within the warehouse. One respondent emphasized, *"A well-structured layout ensures that goods move seamlessly from receiving to storage, and then to the shipping area. This flow impacts the speed of order processing and, ultimately, customer satisfaction."* This perspective aligns with findings by Buzu (2021), highlighting that the flow of goods, influenced by layout design, is a critical determinant of distribution firm performance.

Additionally, respondents underscored the role of technology integration in warehouse layout. One respondent mentioned, "*Modern warehouses are increasingly incorporating automation and technology. The layout should accommodate these advancements to optimize processes further."* This observation resonates with studies emphasizing the integration of technology, such as automated storage and retrieval systems, as a means to enhance warehouse efficiency, which, in turn, affects distribution firm performance (Buzu, 2021).

4.5.5 Firm Size

The final objective of the study was to assess the moderating effect of firm size on the relationship between warehouse optimization and performance of distribution firms in Kenya. Respondents were therefore asked to indicate their level of agreement with statements on firm size and performance of distribution firms in Kenya. Measures of firm size were the different firm categories that is small, mid-size and large enterprises. Table 4.7 presents summary of the findings obtained.

Regarding small enterprises, the respondents agreed that small enterprises: demonstrate agility and adaptability in responding to market changes due to their streamlined organizational structure (M= 3.701, SD= 1.022); that they often face resource constraints, limiting their ability to invest in advanced technologies and infrastructure compared to larger counterparts. (M= 3.639, SD= 0.645); and that the size of enterprise allows for direct and personalized communication channels, fostering stronger relationships with customers and suppliers. (M= 3.515, SD= 0.636). Regarding medium-sized enterprises, respondents agreed that medium-sized enterprises: often possess sufficient resources to invest in technology upgrades and process improvements, contributing to their competitiveness in the market (M= 3.766,

SD= 0.737); that the organizational structure of medium-sized enterprises enables effective collaboration and coordination among departments, enhancing overall operational performance (M= 3.724, SD= 1.109); and that they strike a balance between flexibility and stability, allowing for innovation while maintaining operational efficiency (M= 3.714, SD= 0.889). On large enterprises, the respondents agreed that large enterprises benefit from economies of scale, allowing them to negotiate better terms with suppliers and achieve cost efficiencies in operations (M= 3.764, SD= 0.845); that the size and scope of large enterprises enable significant investments in research and development, driving innovation and market leadership (M= 3.763, SD= 0.796); and that they have the capacity to implement comprehensive quality control measures and standardized processes, ensuring consistent product/service delivery (M= 3.703, SD= 1.001).

As supported by an aggregate mean of 3.699 (SD= 0.853), it is evident that firm size affects performance of distribution firms in Kenya. Rodriguez and Patel (2021) conducted research on the effect of firm size on corporate performance and found that firm size, as one of the most recognized determinants of financial performance, had a significant impact. The study's focus on the size-related factors of warehouse capacity, packing area, and employee count aligns with their findings and supports the notion that firm size plays a crucial role in determining performance. Furthermore, Adebayo (2020) explored the influence of firm size on profitability and identified a significant positive influence of firm size on firm profitability. This aligns with our findings that firm size, when measured in terms of warehouse capacity, packing area, and the number of employees, affects the performance of distribution firms. Additionally, Pila, Muturi and Olweny (2022) investigated the relationship between firm size and financial performance in the context of commercial banks in Kenya. Although our study focuses on distribution firms, the insight that both total assets and the number of employees significantly affect performance is consistent with our findings. This reinforces the idea that firm size, particularly when evaluated through various parameters, plays a vital role in influencing organizational performance.

Table 4.7: Descriptive Statistics on Firm Size

	1 %	2 %	3 %	4 %	5 %	Mean	Std. Dev
Small Enterprises							
Small enterprises demonstrate agility and adaptability in responding to market changes due to their streamlined organizational structure	4.0	6.9	14.9	63.2	10.9	3.701	1.022
Small enterprises often face resource constraints, limiting their ability to invest in advanced technologies and infrastructure compared to larger counterparts.	4.1	15.8	21.1	42.7	16.4	3.515	0.636
The size of enterprise allows for direct and personalized communication channels, fostering stronger relationships with customers and suppliers.	5.0	10.0	22.8	40.6	21.7	3.639	0.645
Medium-Sized Enterprises							
Medium-sized enterprises strike a balance between flexibility and stability, allowing for innovation while maintaining operational efficiency	3.6	10.2	13.8	56.1	16.3	3.714	0.889
Medium-sized enterprises often possess sufficient resources to invest in technology upgrades and process improvements, contributing to their competitiveness in the market	4.1	4.7	24.0	45.0	22.2	3.766	0.737
The organizational structure of medium-sized enterprises enables effective collaboration and coordination among departments, enhancing overall operational performance	1.8	9.4	12.4	67.6	8.8	3.724	1.109
Large Enterprises							
Large enterprises benefit from economies of scale, allowing them to negotiate better terms with suppliers and achieve cost efficiencies in operations	0.6	6.9	23.6	53.4	15.5	3.764	0.845
The size and scope of large enterprises enable significant investments in research and development, driving innovation and market leadership	5.3	8.9	13.6	48.5	23.7	3.763	0.796

	1 %	2 %	3 %	4 %	5 %	Mean	Std. Dev
Large enterprises have the capacity to implement comprehensive quality control measures and standardized processes, ensuring consistent product/service delivery	2.7	12.4	9.7	62.2	13.0	3.703	1.001
Aggregate Score						**3.699**	**0.853**

Firm size by Number of employees

The study measured firm size using the number of employees, categorizing firms as follows: small firms (0–49 employees), medium firms (50–249 employees), and large firms (500 or more employees). The data was collected from secondary sources, including company reports and industry databases. Analysis of the population of 247 distribution firms revealed that most firms were medium-sized, followed by small firms, with large firms being the least represented. This distribution reflects the dominant structure of the distribution sector in Kenya, where medium-sized firms constitute the majority of market participants.

Table 4. 8: Distribution of Firms by Size

Firm Size	Number of Firms	Percentage (%)
Small (0–49)	69	28%
Medium (50–249)	129	52%
Large (>500)	49	20%
Total	247	100%

4.5.6 Performance of Distribution Firms

The main objective of the study was to establish the effect of warehouse optimization on performance of distribution firms in Kenya. Having examined the four measures of warehouse optimization, the study sought respondents level of agreement or disagreement on statements related to performance of distribution firms. Performance was measured in terms of inventory turnover rate, order fulfilment accuracy, and on-time delivery. Table 4.9 presents summary of the findings obtained. On inventory turnover rate, the respondents agreed that their firm maintains a high inventory

turnover rate, indicating efficient management of stock levels and timely movement of goods through the supply chain (M= 3.808, SD= 0.895); that their firm's inventory turnover rate reflects their ability to respond promptly to market demand fluctuations and ensure a continuous flow of products to customers (M= 3.749, SD= 0.772); and that inventory turnover rate is closely monitored and optimized within their firm to minimize holding costs and reduce the risk of obsolete inventory (M= 3.681, SD= 0.916). These findings resonate with research by Beard and Dess (2016), who emphasized the importance of firm characteristics, such as profitability, as determinants of financial performance. The respondents' satisfaction with profitability aligns with the idea that firms with healthier revenue growth are more likely to experience enhanced performance (Ali, 2024).

Regarding order fulfilment accuracy, they agreed that they continuously strive to improve order fulfilment accuracy through process optimization and employee training programs, reflecting our commitment to operational excellence (M= 3.559, SD= 0.784); and that their firm prides itself on consistently achieving high order fulfilment accuracy, minimizing errors and enhancing customer satisfaction (M= 3.521, SD= 0.746). This reflects a focus on efficiency and responsiveness within distribution firms, as noted in the literature on warehouse layout and organization performance (Ernawati, *et al*, 2022). The emphasis on shorter cycle times is indicative of efforts to streamline operations and meet customer demands more swiftly. Finally, on on-time delivery, they agreed that distribution firm consistently meets or exceeds delivery deadlines, ensuring on-time delivery of orders to customers as promised (M= 3.741, SD= 0.812); and that they prioritize on-time delivery to uphold customer satisfaction and loyalty, leveraging efficient route planning and transportation management strategies (M= 3.676, SD= 0.827). This echoes findings of Singhal and Singhal (2020) that distribution firms place a strong emphasis on order fulfilment accuracy and on-time delivery, aligning with the broader objectives of operational excellence and customer-centricity. These findings support the notion that efficient warehouse layout and organization play a significant role in driving operational performance and customer satisfaction within distribution firms, as highlighted in previous research (Ali, 2024).

Table 4.9: Descriptive Statistics on Performance of Distribution Firms

	1 %	2 %	3 %	4 %	5 %	Mean	Std. Dev
Inventory Turnover Rate							
Our firm maintains a high inventory turnover rate, indicating efficient management of stock levels and timely movement of goods through the supply chain	2.9	6.4	16.3	55.8	18.6	3.808	0.895
The inventory turnover rate is closely monitored and optimized within our firm to minimize holding costs and reduce the risk of obsolete inventory.	1.4	6.5	24.6	57.2	10.1	3.681	0.916
Our firm's inventory turnover rate reflects our ability to respond promptly to market demand fluctuations and ensure a continuous flow of products to customers..	1.7	5.7	26.3	48.6	17.7	3.749	0.772
Order Fulfilment Accuracy							
Our firm prides itself on consistently achieving high order fulfilment accuracy, minimizing errors and enhancing customer satisfaction.	1.2	16.6	22.1	49.1	11.0	3.521	0.746
We continuously strive to improve order fulfilment accuracy through process optimization and employee training programs, reflecting our commitment to operational excellence.	3.9	11.8	21.1	51.0	12.3	3.559	0.784
On-Time Delivery							
Our distribution firm consistently meets or exceeds delivery deadlines, ensuring on-time delivery of orders to customers as promised	3.4	4.6	23.6	51.1	17.2	3.741	0.812
We prioritize on-time delivery to uphold customer satisfaction and loyalty, leveraging efficient route planning and transportation management strategies	4.1	12.2	13.5	52.7	17.6	3.676	0.827

The study also collected secondary data on Inventory Turnover Rate and Order Fulfillment Accuracy for a period of 5 years between 2019 and 2023. The results were as shown in Table 4.10. The analysis of the inventory turnover rate and order fulfillment accuracy over the five-year period from 2019 to 2023 reveals a clear upward trend in both performance indicators, highlighting significant improvements in warehouse efficiency and operational effectiveness among distribution firms.

In 2019, the inventory turnover rate stood at 6.2, accompanied by an order fulfillment accuracy of 91.3%. These figures suggest a moderate level of efficiency in inventory management and order processing. However, in 2020, both metrics experienced a slight decline, with turnover reducing to 5.8 and fulfillment accuracy dropping to 89.7%. This downturn may be attributed to the global disruptions caused by the COVID-19 pandemic, which led to challenges such as supply chain delays, demand fluctuations, and overstocking due to uncertain market conditions. The decline underscores the vulnerability of rigid inventory systems during periods of crisis.

From 2021 onwards, a recovery trend is observed, with the inventory turnover rate increasing to 6.5 and fulfillment accuracy improving to 92.1%. This suggests that distribution firms began to adapt by implementing more flexible and data-driven inventory strategies. The gains continued into 2022, where the turnover rate rose to 7.1 and accuracy climbed to 94.0%. These improvements may be attributed to better product placement practices, use of warehouse management systems (WMS), and integration of demand forecasting tools that enable more responsive inventory control.

By 2023, the inventory turnover rate had reached 7.4, and order fulfillment accuracy peaked at 95.2%, reflecting optimal warehouse performance. This progression highlights the positive impact of warehouse optimization strategies, such as placing high-demand items closer to dispatch areas, grouping compatible items together, and organizing inventory by size and weight to reduce handling time and picking errors. High inventory turnover typically indicates that a firm is effectively managing its stock levels, reducing holding costs, and quickly responding to customer demands. Meanwhile, improved fulfillment accuracy means fewer errors, higher customer satisfaction, and stronger market competitiveness.

Table 4. 10: Secondary Data Analysis

Year	Inventory Turnover Rate	Order Fulfilment Accuracy
2019	6.2	91.3%
2020	5.8	89.7%
2021	6.5	92.1%
2022	7.1	94.0%
2023	7.4	95.2%

4.6 Qualitative Analysis

4.6.1 Product Placement

The respondents were requested to indicate how else they think product placement influences performance of distribution firms. From the results, the respondents indicated that effective product placement significantly reduces the time taken to fulfill customer orders, thereby improving operational speed and customer satisfaction. By positioning high-demand or fast-moving items near packing and dispatch zones, distribution firms minimize travel time for pickers. This streamlining allows for quicker order turnaround and more orders processed per shift, which is critical in competitive distribution environments where speed is a key performance indicator. In addition, the respondents indicated that strategic placement of products enhances inventory visibility and control. When products are organized logically—by category, demand frequency, or compatibility—it becomes easier for warehouse staff to locate and track stock.

Further, the respondents indicated that optimized product placement directly impacts worker efficiency and safety. When products are stored according to size, weight, and frequency of access, warehouse workers can perform tasks with greater ease and fewer physical risks. Ergonomic layouts reduce bending, lifting, and stretching, which not only prevents injuries but also enables workers to complete tasks faster and more accurately. Higher productivity levels translate into improved performance metrics for distribution firms. Taiwo, Jaiyesim and Aondover (2024) indicated that separating

incompatible items—such as fragile and heavy products or food and chemicals—prevents damage and contamination, while also streamlining the packing and dispatch process for improved customer satisfaction.

4.6.2 Warehouse Flow

Respondents were also asked to provide their thoughts on how warehouse flow influences performance of distribution firms in Kenya. The study found that efficient warehouse flow can significantly impact inventory management, which is a critical aspect of distribution firms (Aluoch, 2023). A respondent noted, *"Streamlined warehouse processes help us optimize inventory levels, reducing carrying costs while ensuring we meet customer demand."* This balance between cost control and customer satisfaction is a key driver of performance. Timely order fulfillment is paramount in the distribution industry. Warehouse flow directly influences the speed at which orders are processed and shipped to customers. As one respondent stated, *"Smooth warehouse flow ensures that orders are picked, packed, and shipped swiftly. This not only satisfies customers but also boosts our overall performance."*

The study also found that efficient warehouse processes can also contribute to minimizing returns, a critical factor in performance assessment. Respondents pointed out, *"A well-organized warehouse reduces errors, leading to fewer returns and associated costs."* This sentiment aligns with the Nee (2020) emphasis on reducing material obsolescence and improving communication as contributions of inventory classification to stores' efficiency. Also, warehouse flow directly impacts customer satisfaction, a cornerstone of performance in distribution firms. When products are readily available and orders are delivered on time, customers are more likely to remain loyal. This is supported in Guliti et al.'s (2019) research on the relationship between warehouse operation efficiency and organizational performance.

4.6.3 Retrieval Systems

Respondents were asked to provide other ways they think retrieval systems influence performance of distribution firms in Kenya. The respondents provided valuable insights into other ways they believe retrieval systems influence the performance of

distribution firms in Kenya. One respondent highlighted the significance of *"streamlined operations,"* noting that retrieval systems "*minimize the chaos associated with manual searches and ensure that the right products are located quickly."* This viewpoint underscores the role of retrieval systems in enhancing operational efficiency, a crucial factor in a competitive distribution environment. Another participant emphasized the role of data analytics in performance improvement, stating, *"Retrieval systems provide a wealth of data that can be harnessed for better decision-making."* This perspective aligns with the idea that retrieval systems not only facilitate the physical movement of goods but also offer valuable insights that can inform strategic choices.

A respondent pointed out that retrieval systems contribute to *"inventory accuracy,"* explaining that *"automated systems reduce the chances of errors in tracking and managing inventory."* This view underscores the importance of retrieval systems in maintaining precise inventory records, which is essential for efficient supply chain management. Furthermore, one participant emphasized the importance of *"order fulfilment speed,"* stating, *"Fast retrieval means faster order processing and delivery, which keeps customers satisfied."* This perspective highlights the direct link between retrieval systems and customer satisfaction, a critical aspect of a distribution firm's performance. Additionally, a respondent highlighted the cost-saving aspect, stating, *"Automated retrieval systems save on labor costs, making operations more cost-effective."* This viewpoint echoes the idea that retrieval systems can lead to significant cost reductions, ultimately impacting the financial performance of distribution firms. The respondents' viewpoints underscore the multifaceted influence of retrieval systems on the performance of distribution firms in Kenya.

4.6.5 Firm Size

Respondents were asked to indicate other ways they think firm size influences performance of distribution firms. One recurring theme in the respondents' feedback is the notion that firm size can impact a distribution firm's ability to negotiate and secure favorable deals with suppliers. As one respondent aptly put it, *"Larger firms often have more bargaining power with suppliers due to their scale, which can lead to*

better prices and terms." This observation aligns with the idea that larger firms, with their greater market presence and resources, may have a competitive advantage in supplier negotiations, potentially leading to cost savings that positively affect their performance. Moreover, some respondents emphasized the significance of firm size in terms of logistics and distribution network management. One respondent noted, *"Larger firms can afford to invest in advanced logistics systems and a broader distribution network, which can enhance efficiency."* This perspective highlights the operational advantages that larger distribution firms may possess. With the ability to invest in cutting-edge technologies and expand their reach, they can optimize their supply chain processes and better serve customers, ultimately boosting their performance.

Additionally, respondents touched upon the role of firm size in building and maintaining customer relationships. A respondent mentioned, *"Bigger firms often have more resources to dedicate to customer service and support, which can lead to higher customer satisfaction."* This sentiment underscores the potential for larger firms to invest in customer-centric strategies, such as personalized service and faster response times, which can contribute to improved performance through increased customer loyalty and retention. Furthermore, respondents highlighted the financial stability that often accompanies larger firms. One respondent remarked, *"Larger firms tend to weather economic downturns better due to their financial reserves, ensuring consistent performance."* This perspective emphasizes the resilience and stability that firm size can provide, which is particularly advantageous during challenging economic times.

4.7 Diagnostic Tests

Diagnostic tests were performed to test the assumptions of linear regression. The assumptions tested were linearity, normality, autocorrelation, multicollinearity, and homoscedasticity. In case of violation of the regression assumptions, the confidence intervals as well as other scientific insights derived from the regression model may be regarded as misleading, biased or inefficient and therefore the inferences derived incapable of being generalizable on other data

4.7.1 Normality Test

According to Kleinbaum and David (2023) normality tests are supplementary to the graphical assessment of the model and therefore the major tests for the assessment of normality are Kolmogorov-Smirnov (K-S) test, Lilliefors corrected K-S test, Shapiro-Wilk test, Anderson-Darling test, Cramer-von Mises test, D'Agostino skewness test, Anscombe-Glynn kurtosis test, D'Agostino-Pearson omnibus test and the Jarque-Beratestest (Breusch, & Pagan, 2022). Out of the list, the mostly used test is the K-S test and Shapiro-Wilk tests (Breusch, & Pagan, 2021) which can be conducted in the SPSS. When the standard deviation values are greater than 0.05, it can be inferred that the predictor and response variables have a normal distribution. Based on the output in table 4.12 below, all the standard deviation values were > 0.05, indicating that there was normal distribution of the data.

Table 4.11: One-Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test

		Product placement	Warehouse flow	Retrieval systems	Warehouse layout	Performance
N		6	6	6	6	6
Normal Parameters[a,b]	Mean	2.5952	2.6429	2.8810	2.6524	1.9429
	Std. Deviation	.28637	.39002	.61399	.51599	.49952
Most Extreme Differences	Absolute	.170	.175	.351	.220	.245
	Positive	.116	.175	.351	.220	.160
	Positive	.170	.116	.267	.170	.245
Kolmogorov-Smirnov Z		.450	.462	.928	.582	.647
Asymp. Sig. (2-tailed)		.988	.983	.355	.887	.796

a. Test distribution is Normal.
b. Calculated from data.

4.7.2 Multicollinearity Test

Two independent variables (X_1 and X_2) are said to be collinear if one can be expressed as a linear function of the other (Shrestha,2020). In order to determine the strength of a linear relationship between two variables, a Multicollinearity test was done. Two variables are said to be positively related when there is perfect correlation. In a situation where there is a value of -1, this means a perfect negative correlation (Shrestha,2020). Weaker negative or positive correlations is when Correlation coefficient (r) is between -1 and +1 while a value of 0 means the variables are perfectly

independent. Correlation analysis will help test whether there is multicollinearity among predictor variables.

The consequence of multicollinearity is that it creates a wider confidence interval and one can easily make wrong inferences. High degree of correlation between variables on the other hand brings about the problem of multicollinearity (Breusch & Pagan, 2023). Multicollinearity of variables will be tested by using the tolerance value with tolerance level of more than 0.1 and variance inflation factor (VIF) with a tolerance level of less than 10 (Shrestha,2020). Based on the results in table 4.13 below, all the VIF values are between 1 and 10, indicating that there is no multicollinearity

Table 4.12: Multi-Collinearity Test

Variables	Collinearity Statistics	
	Tolerance	**VIF**
Product placement	0.169	5.9
Warehouse flow	0.218	4.596
Retrieval systems	0.11	9.124
Warehouse layout	0.504	1.985
Firm size	0.298	3.359

4.7.3 Heteroscedasticity Test

The assumption of the classical linear regression model (CLRM) is that the disturbance (μ_i) entering the population regression function (PRF) have the same variance (homoscedastic). Where this is not the case, then we have the situation of heteroscedasticity in the data (Taherdoost, 2021). Running a regression model without accounting for heteroscedasticity would lead to biased parameter estimates. To test for heteroscedasticity, the Breusch-Pagan/Godfrey test (1979) and the Modified Wald test was used (Shrestha,2020). In the event the null hypothesis indicates that the error variance is homoscedastic, the null hypothesis will be rejected if the error term is found to be varying. Based on the scatter plot below, the spots are diffused and do not form a clear specific pattern. Inference can be drawn to suggest that regression model does not create heteroscedastic problem.

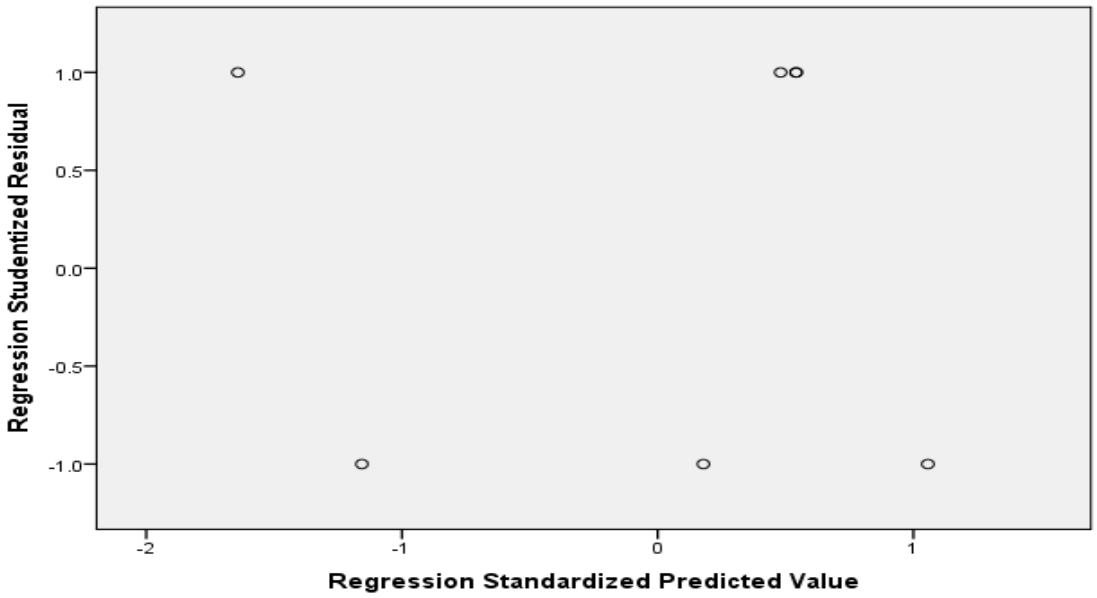

Figure 4.4: Scatter Graph

4.8 Correlation Analysis

The study computed Correlation analysis to determine the strength and the direction of the relationship between the variables being studied. In this study, correlation analysis was done to test the relationship between warehouse optimization and performance of distribution firms in Kenya. If the correlation values are r = ±0.1 to ±0.29 then the relationship between the two variables is small, if it is r = ±0.3 to ±0.49 the relationship is medium, and when r= ±0.5 and above there is a strong relationship between the two variables under consideration. Table 4.14 presents the findings obtained.

On the correlation between performance of distribution firms and product placement the Pearson correlation coefficient (r) of 0.615 is highly positive and statistically significant ($p < 0.05$). This suggests a strong positive relationship between product placement and the performance of distribution firms. This finding aligns with the literature by Aghbar and Al-Qaseem (2024) emphasizing the importance of efficient product placement and inventory management in optimizing warehouse operations. The results suggest that firms that strategically manage their product placements tend to achieve better overall performance.

On the correlation between performance of distribution firms and warehouse flow, the Pearson correlation coefficient of 0.742 is highly positive and statistically significant ($p < 0.05$). This indicates a strong positive relationship between warehouse flow and the performance of distribution firms. This result resonates with Shale (2024) on automated storage and retrieval systems (ASRS) and their impact on warehouse efficiency. The findings imply that firms with optimized warehouse flow tend to experience improved performance.

Moving on to performance of distribution firms and retrieval systems, a Pearson correlation coefficient of 0.786 is observed, and it is highly positive and statistically significant ($p < 0.05$). This indicates a strong positive relationship between retrieval systems and the performance of distribution firms. This finding is consistent with the literature by Eder (2022) on ASRS, where efficient retrieval systems contribute to better warehouse organization and overall performance. The results suggest that firms that invest in advanced retrieval systems tend to achieve higher levels of performance.

Lastly, on the correlation between performance of distribution firms and warehouse layout is examined, the Pearson correlation coefficient of 0.753 is highly positive and statistically significant ($p < 0.05$). This indicates a strong positive relationship between warehouse layout and the performance of distribution firms. These results align with the literature on warehouse layout optimization and its impact on organization performance (Jinxiang, Goetschalckx & Mcginnis, 2019). The findings suggest that firms that design their warehouse layout efficiently tend to experience improved performance.

Table 4.13: Correlation Analysis

		Performance of Distribution firms	Product placement	Warehouse flow	Retrieval systems	Warehouse layout
Performance of Distribution firms	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	247				
Product placement	Pearson Correlation	.615**	1			
	Sig. (2-tailed)	.000				.
	N	247	247			
Warehouse flow	Pearson Correlation	.742**	.261	1		
	Sig. (2-tailed)	.000	.147			
	N	247	247	247		
Retrieval systems	Pearson Correlation	.786**	.325	.264	1	
	Sig. (2-tailed)	.000	.168	.078		
	N	247	247	247	247	
Warehouse layout	Pearson Correlation	.753**	.317	.336	.266	1
	Sig. (2-tailed)	.000	.123	.574	.278	
	N	247	247	247	247	247

**. Correlation is significant at the 0.01 level (2-tailed).

4.9 Statistical Modelling

Multiple regression analysis was done to test the combined effect of product placement, warehouse flow, retrieval systems and warehouse layout on performance of distribution firms in Kenya. The findings were presented in three tables discussed in the subsections below.

Model summary was used to measure the amount of variation in dependent variable as a result of changes in the independent variables. In this study, it was used to establish the amount of variation in performance of distribution firms in Kenya as a result of changes in product placement, warehouse flow, retrieval systems and warehouse layout. Table 4.15 presents summary of the findings obtained. From the findings, the value of R-squared was .681, an indication that 68.1% of variation in performance of distribution firms in Kenya can be explained by changes in product placement, warehouse flow, retrieval systems and warehouse layout.

This result aligns with the literature on warehouse optimization and its impact on organizational performance. As discussed in the literature, efficient product placement (Sitienei, Mugun & Maru, 2023), streamlined warehouse flow (Clough & Sanderson, 2021), advanced retrieval systems (Eder, 2022), and well-designed warehouse layouts (Jinxiang, Goetschalckx & Mcginnis, 2019) are all key factors that contribute to improved performance in distribution firms. The strong positive relationship (correlation coefficient of 0.825) further confirms that as these variables are optimized, the performance of distribution firms tends to increase.

However, the remaining 31.9% suggest that there are other factors that can be attributed to variation in performance of distribution firms in Kenya that were not discussed in this study. In addition, the correlation coefficient (R) value of 0.825 suggest that the variables have a strong positive relationship.

Analysis of variance was used to test the significance of the model developed. The significance of the model was tested at 95% confidence interval. This suggests that if the p-value was less than 0.05, it suggests that the model is significant. From the findings presented in Table 4.15, the p-value for the model was 0.000 which is less than the selected level of significance (0.05). This suggests that the model as fitted is significant in predicting performance of distribution firms in Kenya. In addition, the F-tabulated value was 129.145 which is greater than the F-critical value (2.409), from the f-distributions table supporting the significance of the model. Therefore, the variables product placement, warehouse flow, retrieval systems and warehouse layout are considered significant predictors of performance of distribution firms in Kenya. The variables under study, namely product placement, warehouse flow, retrieval systems, and warehouse layout, have been identified in previous research as significant predictors of performance in distribution firms (Sitienei, Mugun & Maru, 2023; Clough & Sanderson, 2016; Eder, 2022; Jinxiang, Goetschalckx & Mcginnis, 2019).

From the coefficients in Table 1.15, the following regression model was fitted;

$$Y = 0.338 + 0.235\,X_1 + 0.216\,X_2 + 0.222\,X_3 + 0.258\,X_4$$

Where Y is performance of distribution firms in Kenya; X_1 is product placement; X_2 is warehouse flow; X_3 is retrieval systems; and X_4 is warehouse layout.

Starting with product placement, the beta value of 0.235 is statistically significant at p = 0.001. This suggests that product placement has a positive and significant influence on the performance of distribution firms. This finding aligns with research by Sitienei, Mugun and Maru, (2023) indicating that effective product placement strategies can enhance the efficiency and profitability of distribution firms. Optimizing product placement can lead to improved customer satisfaction and overall performance.

On warehouse flow, the beta value of 0.216 is statistically significant at p = 0.012. This signifies that warehouse flow plays a significant role in shaping the performance of distribution firms. The efficient movement of goods within a warehouse has been recognized as a critical factor in reducing operational costs and enhancing overall performance (Clough & Sanderson, 2021). This result reinforces the importance of streamlining warehouse processes to achieve better performance outcomes.

Regarding retrieval systems, the beta value of 0.222 is highly significant at p = 0.000. This highlights the substantial impact of retrieval systems on the performance of distribution firms. Automated storage and retrieval systems (AS/RS) have been shown to significantly improve efficiency and accuracy in warehouse operations (Onwuchekwa, 2021). This finding underscores the need for advanced retrieval systems to optimize performance.

Finally, warehouse layout exhibits a beta value of 0.258, which is statistically significant at p = 0.000. This underscores the considerable influence of warehouse layout on the performance of distribution firms. A well-designed warehouse layout can maximize space utilization, reduce cycle times, and improve overall efficiency (Jinxiang, Goetschalckx & Mcginnis, 2019). This result reinforces the importance of strategic planning in warehouse layout for enhancing distribution firm performance.

Table 4.14: Unmoderated Multiple Regression Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.825[a]	.681	.676	.35649

a. Predictors: (Constant), Warehouse layout, Product placement, Retrieval systems, Warehouse flow

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	65.650	4	16.412	129.145	.000[b]
	Residual	30.755	242	.127		
	Total	96.404	246			

a. Dependent Variable: Performance of Distribution firms

b. Predictors: (Constant), Warehouse layout, Product placement, Retrieval systems, Warehouse flow

Regression Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.338	.154		2.195	.029
	Product placement	.235	.054	.039	4.352	.001
	Warehouse flow	.216	.085	.197	2.541	.012
	Retrieval systems	.222	.061	.257	3.639	.000
	Warehouse layout	.258	.067	.265	3.851	.000

a. Dependent Variable: Performance of Distribution firms

4.10 Simple Linear Regression

4.10.1 Simple Regression for Product Placement

The first specific objective of the study was to establish the effect of product placement on performance of distribution firms in Kenya. The associated null hypothesis was H_{01} Product placement has no significant effect on performance of distribution firms in Kenya. A univariate analysis was conducted in which performance of distribution firms in Kenya was regressed on product placement.

The R-Squared was used to test the variation in the dependent variable that can be explained by the independent variables. The greater the value of R-squared the greater

the effect of independent variable. The R Squared can range from 0.000 to 1.000, with 1.000 showing a perfect fit that indicates that each point is on the line. As indicated in Table 4.16, the R-squared for the relationship between product placement and performance of distribution firms in Kenya was 0.378; this is an indication that at 95% confidence interval, 37.8% of variation in performance of distribution firms in Kenya can be attributed to changes in in product placement. Therefore, product placement can be used to explain 37.8% of changes in performance of distribution firms in Kenya. This agrees with Beard and Dess (2021) who emphasized the importance of firm characteristics, such as product placement strategies, in determining performance.

To test the significance of the model on product placement, analysis of variance was used. Significance was tested at 95% confidence interval. From the findings in Table 4.16, the p-value was 0.000 which is less than the selected level of significance (0.05) and indication that the model as fitted was significant. Also, the F-calculated value (148.875) was greater than the F-critical Value (3.880) from the f-distributions table. This supports the significance of the model.

From the results in Table 4.16, the following regression model was fitted.

$$Y = 0.893 + 0.552\ X_1$$

(X_1 is Product placement)

The coefficient results showed that the constant had a coefficient of 0.893 suggesting that if product placement was held constant at zero, performance of distribution firms in Kenya would be at .893 units. In addition, results showed that product placement coefficient was 0.552 indicating that a unit increase in product placement would result in a 0.552 increase in performance of distribution firms in Kenya. It was also noted that the P-value for product placement coefficient was 0.000 which is less than the set 0.05 significance level indicating that product placement was significant. Based on these results, the study rejected the null hypothesis H_{01} (Product placement has no significant effect on performance of distribution firms in Kenya) and accepted the alternative that product placement has significant effect on performance of distribution firms in Kenya. This result aligns with the research by Meiryani et al. (2020), which explored the effect of capital structure on a firm's financial performance and found that certain factors, like product placement, can have a substantial impact on a firm's

overall performance. This consistency in findings underscores the critical role of effective product placement in enhancing the performance of distribution firms, as supported by empirical evidence.

Table 4. 15: Simple regression Model for Product Placement

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.615[a]	.378	.375	.49473

a. Predictors: (Constant), Product placement

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.438	1	36.438	148.875	.000[b]
	Residual	59.966	245	.245		
	Total	96.404	246			

a. Dependent Variable: Performance of Distribution firms
b. Predictors: (Constant), Product placement

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.893	.166		5.376	.000
	Product placement	.552	.045	.615	12.201	.000

a. Dependent Variable: Performance of Distribution firms

4.10.2 Simple Regression for Warehouse Flow

The second objective of the study was to determine the effect of warehouse flow on performance of distribution firms in Kenya. The corresponding hypothesis tested was H_{02} Warehouse flow does not significantly affect performance of distribution firms in Kenya. A simple regression analysis was therefore conducted where performance of distribution firms in Kenya was regressed on warehouse flow.

The R-Squared was used to test the variation in the dependent variable that can be explained by the independent variables. As indicated in Table 4.17, the R-squared for the relationship between warehouse flow and performance of distribution firms in Kenya was 0.550; this is an indication that at 95% confidence interval, 55% of variation in performance of distribution firms in Kenya can be attributed to changes in warehouse flow. In essence, this finding suggests that warehouse flow is a significant factor contributing to the performance of distribution firms in Kenya, explaining over

half of the observed variations. This observation is in line with the research conducted by Kioko (2018), which emphasized the significance of variables in explaining financial performance, providing credibility to the current study's findings regarding warehouse flow's substantial impact on performance.

To test the significance of the model on warehouse flow, analysis of variance was used. Significance was tested at 95% confidence interval. From the findings in Table 4.17, the p-value was 0.000 which is less than the selected level of significance (0.05) and indication that the model as fitted was significant. Also, the F-calculated value (299.654) was greater than the F-critical Value (3.880) from the f-distributions table. This supports the significance of the model.

From the results in Table 4.17, the following regression model was fitted.

$$Y = 0.154 + 0.813\ X_2$$

(X_2 is Warehouse flow)

The coefficient results showed that the constant had a coefficient of 0.154 suggesting that if warehouse flow was held constant at zero, performance of distribution firms in Kenya would be at .145 units. In addition, results showed that warehouse flow coefficient was 0.813 indicating that a unit increase in warehouse flow would result in a 0.813 increase in performance of distribution firms in Kenya. It was also noted that the P-value for warehouse flow coefficient was 0.000 which is less than the set 0.05 significance level indicating that warehouse flow was significant. Based on these results, the study rejected the null hypothesis H_{02} (Warehouse flow has no significant effect on performance of distribution firms in Kenya) and accepted the alternative that warehouse flow has significant effect on performance of distribution firms in Kenya. This aligns with the study conducted by Eder (2022), which assessed the performance of shuttle-based storage and retrieval systems. Eder's research emphasized the importance of efficient flow within a warehouse system. The correlation found in this study reaffirms that an optimized warehouse flow can indeed have a significant and positive impact on the overall performance of distribution firms, corroborating the importance of efficient warehouse operations in enhancing organizational outcomes.

Table 4.16: Simple Regression Model for Warehouse Flow

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.742[a]	.550	.548	.42071

a. Predictors: (Constant), Warehouse flow

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	53.039	1	53.039	299.654	.000[b]
	Residual	43.365	245	.177		
	Total	96.404	246			

a. Dependent Variable: Performance of Distribution firms
b. Predictors: (Constant), Warehouse flow

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.154	.057		2.702	.037
	Warehouse flow	.813	.047	.742	17.311	.000

a. Dependent Variable: Performance of Distribution firms

4.10.3 Simple Regression for Retrieval Systems

The third objective of the study was to determine the effect of retrieval systems on performance of distribution firms in Kenya. Its corresponding null hypothesis was H_{03} Retrieval systems has no significant effect on performance of distribution firms in Kenya. The study conducted a simple regression analysis to examine the relationship between performance of distribution firms in Kenya and retrieval systems.

The R-Squared was used to test the variation in the dependent variable as a result of changes in the independent variable. As indicated in Table 4.18, the R-squared for the relationship between retrieval systems and performance of distribution firms in Kenya was 0.617; this is an indication that at 95% confidence interval, 61.7% of variation in performance of distribution firms in Kenya can be attributed to changes in retrieval systems. In essence, this finding suggests that retrieval systems is a significant factor contributing to the performance of distribution firms in Kenya, explaining 61.7 % of the observed variations. This agrees with research conducted by Onwuchekwa's (2016) which highlights that effective retrieval systems within distribution firms are a significant factor contributing to their performance, aligning with the principles of efficient information organization discussed in the literature. This further supports the

idea that well-structured and automated retrieval systems play a vital role in improving the performance of various types of organizations, including distribution firms.

To test the significance of the model on retrieval systems, analysis of variance was used. Significance was tested at 95% confidence interval. From the findings in Table 4.18, the p-value was 0.000 which is less than the selected level of significance (0.05) and indication that the model as fitted was significant. Also, the F-calculated value (395.222) was greater than the F-critical Value (3.880) from the f-distributions table. This supports the significance of the model. Therefore, the model as fitted is significant in predicting performance of distribution firms in Kenya.

From the results in Table 4.18, the following regression model was fitted.

$$Y = 0.287 + 0.725\ X_3$$

(X_3 is Retrieval systems)

The coefficient results showed that the constant had a coefficient of 0.287 suggesting that if retrieval systems was held constant at zero, performance of distribution firms in Kenya would be at .287 units. In addition, results showed that retrieval systems coefficient was 0.725 indicating that a unit increase in retrieval systems would result in a 0.725 increase in performance of distribution firms in Kenya. It was also noted that the P-value for retrieval systems coefficient was 0.000 which is less than the set 0.05 significance level indicating that retrieval systems was significant. Based on these results, the study rejected the null hypothesis H_{03} (retrieval systems has no significant effect on performance of distribution firms in Kenya) and accepted the alternative that retrieval systems has positive significant effect on performance of distribution firms in Kenya. This is consistent with the research conducted by Clough and Sanderson (2021) that emphasized the importance of evaluating information retrieval systems to measure their effectiveness in helping users fulfill their information needs. In this context, the finding aligns with the literature by highlighting the significance of retrieval systems in distribution firms. It suggests that efficient retrieval systems play a vital role in facilitating timely and accurate access to information or inventory, ultimately contributing to improved overall performance within distribution firms in Kenya

Table 4. 17: Simple Regression Model for Retrieval Systems

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.786[a]	.617	.616	.38805

a. Predictors: (Constant), Retrieval systems

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	59.512	1	59.512	395.222	.000[b]
	Residual	36.892	245	.151		
	Total	96.404	246			

a. Dependent Variable: Performance of Distribution firms
b. Predictors: (Constant), Retrieval systems

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.287	.133		2.160	.032
	Retrieval systems	.725	.036	.786	19.880	.000

a. Dependent Variable: Performance of Distribution firms

4.10.4 Simple Regression for Warehouse Layout

The fourth objective of the study was to find out the effect of warehouse layout on performance of distribution firms in Kenya. The corresponding null hypothesis tested was H_{04} Warehouse layout does not significantly affect performance of distribution firms in Kenya. The study conducted a simple regression analysis to examine the warehouse layout relationship between performance of distribution firms in Kenya and warehouse layout.

The R-Squared was used to test the variation in the dependent variable as a result of changes in the independent variable. As indicated in Table 4.19, the R-squared for the relationship between warehouse layout and performance of distribution firms in Kenya was 0.567; this is an indication that at 95% confidence interval, 56.7% of variation in performance of distribution firms in Kenya can be attributed to changes in warehouse layout. In essence, this finding suggests that warehouse layout is a significant factor contributing to the performance of distribution firms in Kenya, explaining 56.7% of the observed variations. This aligns with the work by Jinxiang, Goetschalckx, and McGinnis (2019) on warehouse design and performance evaluation that emphasized the importance of optimizing warehouse space and layout to improve the efficiency

and flow of operations within a facility. This finding reinforces the notion that an efficient and well-designed warehouse layout can significantly impact the performance of distribution firms.

To test the significance of the model, analysis of variance was used. Significance was tested at 95% confidence interval. From the findings in Table 4.19, the p-value was 0.000 which is less than the selected level of significance (0.05) and indication that the model as fitted was significant. Also, the F-calculated value (321.262) was greater than the F-critical Value (3.880) from the f-distributions table. This supports the significance of the model. Therefore, the model as fitted is significant in predicting performance of distribution firms in Kenya.

From the results in Table 4.19, the following regression model was fitted.

$$Y = 0.244 + 0.732\ X_4$$

(X_4 is Warehouse layout)

The coefficient results showed that the constant had a coefficient of 0.244 suggesting that if warehouse layout was held constant at zero, performance of distribution firms in Kenya would be at .244 units. In addition, results showed that warehouse layout coefficient was 0.732 indicating that a unit increase in warehouse layout would result in a 0.732 increase in performance of distribution firms in Kenya. It was also noted that the P-value for warehouse layout coefficient was 0.000 which is less than the set 0.05 significance level indicating that warehouse layout was significant. Based on these results, the study rejected the null hypothesis H_{04} (warehouse layout has no significant effect on performance of distribution firms in Kenya) and accepted the alternative that warehouse layout has positive significant effect on performance of distribution firms in Kenya. The finding aligns with the study conducted by Buzu (2021) that emphasized the importance of efficient warehousing management, including aspects like layout, to improve warehouse performance. The positive significant effect observed in the study corresponds to Buzu's findings, underlining the vital role that warehouse layout plays in enhancing the performance of distribution firms, as supported by the cited literature.

Table 4.18: Simple regression Model for Warehouse Layout

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.753[a]	.567	.566	.41261

a. Predictors: (Constant), Warehouse layout

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54.694	1	54.694	321.262	.000[b]
	Residual	41.710	245	.170		
	Total	96.404	246			

a. Dependent Variable: Performance of Distribution firms
b. Predictors: (Constant), Warehouse layout

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.244	.065		3.754	.019
	Warehouse layout	.732	.041	.753	17.924	.000

a. Dependent Variable: Performance of Distribution firms

4.10.5 Simple Regression for Firm Size

The fifth objective of the study was to assess the moderating effect of firm size on the relationship between warehouse optimization and performance of distribution firms in Kenya. Moderation happens when the relationship between the dependent variable and the independent variables is dependent on a third variable (moderating variable). The effect that this variable has is termed as interaction as it affects the direction or strength of the relationship between the dependent and independent variable. To achieve the fifth research objective, the study computed hierarchical regression analysis; this also guided the study in testing the fifth research hypothesis H_{05} Firm size has no significant moderating effect on the relationship between warehouse optimization and performance of distribution firms in Kenya. Firm size (M) was introduced as the moderating variable.

The study combined all the four measures of warehouse optimization (entails product placement, warehouse flow, retrieval systems, and warehouse layout) to form a new variable X. The study then used stepwise regression to establish the moderating effect of firm size (M) on the relationship between warehouse optimization (X) and performance of distribution firms in Kenya (Y).

From the model summary findings in Table 4.20, the first model which is the regression for warehouse optimization (X) alone, the value of R-squared was 0.610 which suggests that 61% change in performance of distribution firms in Kenya can be explained by changes in warehouse optimization. The p-value for the first model (0.000) was less than the selected level of significance (0.05) suggesting that the model was significant. The findings in the second model which constituted warehouse optimization, firm size and interaction term (X*M) as predictors, the r-squared was 0.704. This implies that the introduction of firm size in the second model led a 0.092 increase in r-squared, showing that firm size positively moderates the relationship between warehouse optimization and performance of distribution firms in Kenya.

The finding is in line with research by Kioko (2023) on the relationship between firm size and financial performance of commercial banks in Kenya. Kioko's research highlights how firm size can influence a firm's performance. In this context, the positive moderation effect of firm size on the relationship between warehouse optimization and performance indicates that larger firms, often associated with greater resources and capabilities, can leverage warehouse optimization strategies more effectively to enhance their performance, supporting the alignment with the provided literature.

From the model summary findings in Table 4.20, the F-calculated for the first model, was 383.982and for the second model was 192.428. Since the F-calculated for the two models were more than the F-critical, 3.880 (first model) and 2.642 (second model), the two models were good fit for the data and hence they could be used in predicting the moderating effect of firm size on the relationship between warehouse optimization and performance of distribution firms in Kenya.

Further, by substituting the beta values as well as the constant term from the coefficient’s findings for the first step regression modelling, the following regression model will be fitted:

$$Y = 0.423 + 0.884\ X$$

(X is Warehouse Optimization)

The findings show that when warehouse optimization is held to a constant zero, performance of distribution firms in Kenya will be at a constant value of 0.420. The findings also show that warehouse optimization has a statistically significant effect on performance of distribution firms in Kenya as shown by a regression coefficient of 0.884 (p-value= .000).

By substituting the beta values as well as the constant term from model 2 emanating from the second step in regression modelling the following regression model was fitted:

$$Y= 1.600 + 0.849 X + 1.136 M + 0. 924 X*M$$

Where X is Warehouse Optimization; M is Firm size and X*M is the interaction term between warehouse optimization and firm size.

The findings show that warehouse optimization, firm size, and interaction term (X*M) are held to a constant zero, performance of distribution firms in Kenya will be at a constant value of 1.600. The model also indicated that warehouse optimization had a positive and statistically significant effect on performance of distribution firms in Kenya as shown by a regression coefficient of 0.849 (p-value= 0.000). It is also seen that firm size had a positive and significant effect on performance of distribution firms in Kenya as shown by a regression coefficient 1.136 (P=0.000<0.05). On the other hand, interaction of warehouse optimization and firm size (X*M) also had a positive and significant effect on performance of distribution firms in Kenya as shown by a regression coefficient of 0.924 (p-value= 0.000).

It is therefore seen that warehouse optimization on its own has 0.849 effect on performance of distribution firms in Kenya. However, when interacted with firm size, it has an effect of 0.924. This is a clear indication that introduction of firm size as moderating variable has positive influence on performance of distribution firms in Kenya. The study therefore rejects the null hypothesis and accepts the alternative that firm size has positive significant moderating effect on the relationship between warehouse optimization and performance of distribution firms in Kenya.

The finding is in line with literature by Meiryani *et al*. (2020) which found that firm size can have a significant impact on a firm's financial performance. In the current study, the positive moderating effect of firm size on the relationship between warehouse optimization and performance implies that larger distribution firms in Kenya, due to their size, can enhance their performance more significantly through effective warehouse optimization strategies. This finding corroborates the existing literature, highlighting the importance of considering firm size as a significant factor in improving performance in the distribution industry.

Table 4. 19: Moderated Regression Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.781[a]	.610	.609	.39150	.610	383.982	1	245	.000
2	.839[b]	.704	.700	.34282	.093	38.258	2	243	.000

a. Predictors: (Constant), Warehouse Optimization
b. Predictors: (Constant), Warehouse Optimization, Firm size, X*M

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	58.853	1	58.853	383.982	.000[b]
	Residual	37.551	245	.153		
	Total	96.404	246			
2	Regression	67.846	3	22.615	192.428	.000[c]
	Residual	28.559	243	.118		
	Total	96.404	246			

a. Dependent Variable: Performance of Distribution firms
b. Predictors: (Constant), Warehouse Optimization
c. Predictors: (Constant), Warehouse Optimization, Firm size, X*M

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.423	.171		2.479	.014
	Warehouse Optimization	.884	.045	.781	19.595	.000
2	(Constant)	1.600	.288		5.556	.000
	Warehouse Optimization	.849	.097	.779	8.753	.000
	Firm size	1.136	.136	.923	8.353	.000
	X*M	.924	.352	1.468	6.079	.000

a. Dependent Variable: Performance of Distribution firms

4.11 Hypothesis Testing

Hypothesis testing was conducted to determine whether the independent variables have a statistically significant effect on the dependent variable. The study tested hypotheses derived from the research objectives and theoretical framework using inferential statistical analysis. Specifically, the F-test was employed to assess whether variations in each explanatory variable significantly explain changes in the dependent variable.

The decision rule for hypothesis testing was based on a comparison between the calculated F-statistic (F-calculated) and the critical F-value (F-critical) at the 5 percent level of significance ($\alpha = 0.05$). Where the calculated F-value exceeded the critical F-value, the null hypothesis was rejected, indicating a statistically significant effect. Conversely, where the calculated F-value was less than the critical value, the null hypothesis would fail to be rejected.

Table 4. 20: Hypothesis Testing

Hypothesis testing	F-Critical	F-Calculated	Verdict
Product placement	3.880	148.875	Rejected
Warehouse Flow	3.880	299.654	Rejected
Retrieval Systems	3.880	395.222	Rejected
Warehouse Layout	3.880	321.262	Rejected
firm size	3.880	383.982	Rejected

4.12 Optimal Model

From the coefficients in hypothesis testing, the following regression model was fitted;

$$Y = 0.338 + 0.813 X_1 + 0.732 X_2 + 0.725 X_3 + 0.552 X_4$$

Where

Y is performance of distribution firms in Kenya;

X_1 is; warehouse flow

X_2 is; warehouse layout

X_3 is retrieval systems;

X_4 is. product placement

Since warehouse flow had the highest effect followed by warehouse layout, retrieval systems and product placement, the revised Conceptual framework is as shown below

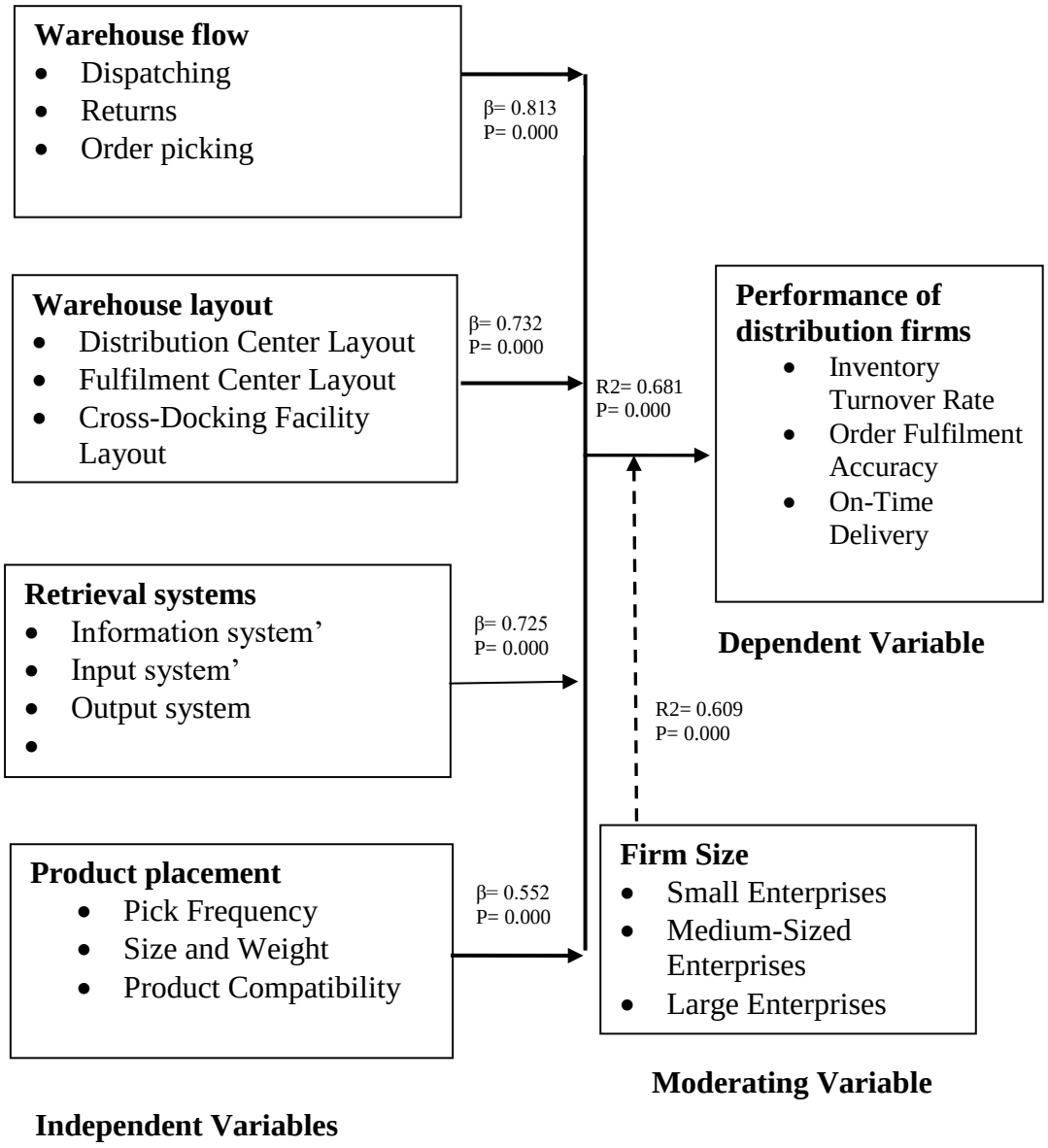

Figure 4. 5: Revised Conceptual Framework

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the study presents summary of findings, conclusion and recommendations. This is guided by the objectives of the study and the research hypothesis. The study was focused on establishing the effect of warehouse optimization on performance of distribution firms in Kenya.

5.2 Summary of Findings

The study presents summary of findings based on specific objectives of the study. The study was guided by the following specific objectives; to establish the effect of product placement , warehouse flow, retrieval systems and warehouse layout on performance of distribution firms in Kenya; and to assess the moderating effect of firm size on the relationship between warehouse optimization and performance of distribution firms in Kenya.

5.2.1 Product Placement

The first objective of the study was to establish the effect of product placement on performance of distribution firms in Kenya. The study found that product placement significantly influences the performance of distribution firms in Kenya. Respondents generally agreed that various aspects of product placement, including pick Frequency, Size and Weight and product compatibility, are relevant and impactful. It was found that high-demand products are positioned closer to the dispatch area to reduce travel time during order picking. In addition, bulky or oversized items are assigned specific storage zones to avoid congestion in the warehouse. Further, it was found that the warehouse layout is regularly adjusted based on changes in product pick frequency. Findings revealed that incompatible products are stored in separate areas to prevent damage or contamination. In addition, the respondents agreed that, frequently picked items are placed in easily accessible locations within the warehouse. Further,

respondents agreed that in their organization, products are stored based on their size and weight to ensure safety and ease of access

5.2.2 Warehouse Flow

The second objective assess the effect of warehouse flow on performance of distribution firms in Kenya. Warehouse flow, encompassing dispatching, returns, and order picking, was identified as a significant factor affecting the performance of distribution firms in Kenya. Respondents emphasized the importance of streamlined warehouse processes in optimizing inventory management, reducing carrying costs, and ensuring timely order fulfilment. Efficient warehouse flow was also linked to minimizing returns, which is critical for overall performance. Respondents noted that efficient operations positively impact customer satisfaction, a key driver of performance in distribution firms. Additionally, respondents highlighted that efficient warehouse processes contribute to overall operational efficiency, reducing labor costs and increasing competitiveness.

5.2.3 Retrieval Systems

The third objective of the study was to determine the effect of retrieval systems on performance of distribution firms in Kenya. Retrieval systems, including information systems, input systems, and output systems, were found to have a significant impact on the performance of distribution firms in Kenya. Respondents acknowledged that retrieval systems lead to streamlined operations, data-driven decision-making, inventory accuracy, and faster order fulfilment. The automation and technology integration associated with retrieval systems were seen as cost-saving measures that contribute to the financial performance of distribution firms. Overall, retrieval systems were perceived as integral to enhancing operational efficiency and decision-making in distribution firms.

5.2.4 Warehouse Layout

The fourth objective of the study was to find out the effect of warehouse layout on performance of distribution firms in Kenya. Regarding distribution center layout,

respondents agreed that the layout effectively optimizes space utilization, minimizes congestion, and enables quick access to inventory for outbound shipments. Similarly, for fulfilment center layout, respondents acknowledged its significant contribution to order fulfilment accuracy, error reduction, and overall operational performance. Furthermore, respondents recognized the importance of cross-docking facility layout in facilitating swift transfer of goods between inbound and outbound shipments, enhancing operational agility, and minimizing handling and storage times. The aggregate mean score of 3.745 (SD=0.853) indicates a generally positive perception of warehouse layout's impact on distribution firm performance.

5.2.5 Firm Size

The final objective of the study was to assess the moderating effect of firm size on the relationship between warehouse optimization and performance of distribution firms in Kenya. For small enterprises, respondents agreed that these firms demonstrate agility and adaptability in responding to market changes, albeit facing resource constraints compared to larger counterparts. Additionally, the size of small enterprises allows for direct and personalized communication channels, fostering stronger relationships with customers and suppliers. In contrast, medium-sized enterprises were perceived to strike a balance between flexibility and stability, possessing sufficient resources to invest in technology upgrades and process improvements. They also leverage their organizational structure for effective collaboration among departments, enhancing overall operational performance. Large enterprises, benefiting from economies of scale, can negotiate better terms with suppliers, invest significantly in research and development, and implement comprehensive quality control measures, ensuring consistent product/service delivery. With an aggregate mean score of 3.699 (SD=0.853), it is evident that firm size, significantly influences the performance of distribution firms in Kenya.

5.3 Conclusions

H01: Product placement has no significant effect on performance of distribution firms in Kenya. The first null hypothesis tested whether product placement had a significant effect on the performance of distribution firms in Kenya. The study's findings revealed

that product placement is statistically significant in explaining the performance of distribution firms in Kenya, and this influence was found to be positive. In other words, an improvement in product placement positively impacts the performance of distribution firms. Therefore, based on the evidence presented, the study concludes that product placement does have a positive and significant effect on the performance of distribution firms in Kenya.

The second null hypothesis examined whether warehouse flow significantly influenced the performance of distribution firms in Kenya. The research results demonstrated that warehouse flow is statistically significant in explaining the performance of distribution firms in Kenya. This significance was associated with a positive impact, implying that improvements in warehouse flow contribute positively to the performance of distribution firms. Consequently, the study concludes that warehouse flow does have a positive and significant effect on the performance of distribution firms in Kenya.

The third null hypothesis aimed to determine whether retrieval systems had a significant effect on the performance of distribution firms in Kenya. The study's findings revealed that retrieval systems are statistically significant in explaining the performance of distribution firms in Kenya, and this influence was found to be positive. In essence, enhancements in retrieval systems positively contribute to the performance of distribution firms. Thus, based on the evidence, the study concludes that retrieval systems positively and significantly affect performance of distribution firms in Kenya.

The fourth null hypothesis assessed whether warehouse layout significantly influenced the performance of distribution firms in Kenya. The research outcomes indicated that warehouse layout is statistically significant in explaining the performance of distribution firms in Kenya. This significance was linked to a positive effect, suggesting that improvements in warehouse layout positively impact the performance of distribution firms. Consequently, the study concludes that warehouse layout does have a significant and positive effect on the performance of distribution firms in Kenya.

The fifth null hypothesis investigated whether firm size had a significant moderating effect on the relationship between warehouse optimization and the performance of distribution firms in Kenya. The research results showed that firm size indeed has a significant moderating effect on this relationship. In particular, the introduction of firm size as a moderating variable positively influenced the relationship between warehouse optimization and the performance of distribution firms. Therefore, based on these findings, the study concludes that firm size does have a significant moderating effect, enhancing the relationship between warehouse optimization and the performance of distribution firms in Kenya.

5.4 Recommendations

Management of distribution firms should adopt a dynamic product placement strategy that regularly reviews and adjusts the warehouse layout based on real-time data such as pick frequency, product size, and compatibility. By continuously analyzing which items are most frequently picked, which ones require special handling, and how products interact with each other in storage and picking, the organization can optimize space utilization, reduce picking errors, and enhance overall operational efficiency

Efficient warehouse flow is crucial for distribution firms, and continuous process improvement should be a top priority. Firms should cultivate a culture of ongoing assessment and optimization of warehouse flow processes to ensure efficiency and effectiveness. Embracing technology is also key. Distribution firms should invest in warehouse management systems (WMS) and automation to streamline operations, reduce errors, and enhance overall performance.

Digital transformation is recommended for retrieval systems. Distribution firms should consider adopting advanced information systems, data analytics, and modern technologies to significantly improve retrieval efficiency. Furthermore, training and skill development programs should be implemented to ensure that employees are proficient in using retrieval systems. A knowledgeable workforce is essential for maximizing the benefits of these systems.

Regularly reviewing and updating warehouse layouts to accommodate changing business needs and optimize operations is essential. Seeking expert advice in designing layouts that minimize travel distances and maximize space utilization is highly recommended. Prioritizing safety and ergonomics in warehouse layout planning is crucial for employee well-being and productivity. A well-designed layout can reduce workplace accidents and enhance overall operational efficiency.

For smaller distribution firms, strategic partnerships and collaborations with larger organizations can be advantageous. These partnerships enable smaller firms to leverage the resources and bargaining power of larger counterparts, leading to cost savings and improved performance. Additionally, smaller firms should invest in technology solutions that level the playing field with larger competitors. This includes adopting modern inventory management systems, e-commerce platforms, and customer relationship management tools. Regardless of size, all distribution firms should prioritize a customer-centric approach. Building strong customer relationships, providing exceptional service, and focusing on customer satisfaction can be a competitive advantage for firms of any size.

5.4.2 Areas for Further Studies

While this study provides valuable insights into the factors influencing the performance of distribution firms in Kenya, it explained four warehouse optimization measures that explained 68.1% of variation in performance of distribution firms in Kenya. The study recommends future studies to focus on other factors that can explain performance of distribution firms in Kenya such as supply chain resilience, environmental sustainability practices, and the influence of e-commerce integration. Future studies can also delve deeper into the role of emerging technologies, such as blockchain and Internet of Things (IoT), in optimizing warehouse operations and their impact on distribution firm performance. Investigating how these cutting-edge technologies can be effectively integrated into distribution processes could offer valuable insights for industry practitioners.

Secondly, the influence of external factors, such as changes in government policies and economic conditions, on the performance of distribution firms warrants

exploration. Examining how regulatory shifts and economic fluctuations affect the strategies and operations of distribution firms in Kenya can provide a comprehensive view of the industry's resilience and adaptability.

Additionally, while this study touched on the moderating effect of firm size, further research can explore in greater detail the role of firm characteristics, such as ownership structure, financial resources, and management practices, in shaping the performance of distribution firms. Investigating how these internal factors interact with the variables examined in this study can provide a more nuanced understanding of firm performance.

Lastly, a comparative analysis of distribution firms in Kenya with those in other regions or countries can offer valuable benchmarking insights. This cross-border perspective can shed light on best practices, innovative strategies, and potential areas for improvement that might not be apparent when examining the industry within a single geographic context.

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APPENDICES

Appendix I: Questionnaire

I. Demographic characteristics of the respondents

1.What is your highest completed education?

PhD	[ ]	Masters	[ ]
Bachelor's degree	[ ]	Diploma	[ ]
Certificate	[ ]		

2. How long have you been stayed at this organization?

Less than 4 years	[ ]	4-10 years	[ ]
Above 10 years	[ ]		

3. Kindly indicate the size of the organization?

Small	[ ]	Medium	[ ]
Large	[ ]		

Section B: Product Placement

Please indicate your level of agreement with the following statements on product placement and performance of distribution firms in Kenya. Please kindly tick (√) in the appropriate space that represents your opinion. Use the scale: **Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5)**

Statements.	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Pick Frequency					
In our organization, frequently picked items are placed in easily accessible					

locations within the warehouse.					
In our organization, the warehouse layout is regularly adjusted based on changes in product pick frequency.					
In our organization, high-demand products are positioned closer to the dispatch area to reduce travel time during order picking.					
Size and Weight					
In our organization, products are stored based on their size and weight to ensure safety and ease of access.					
In our organization, heavy items are placed at lower storage levels to reduce handling risks and improve picking efficiency.					
In our organization, bulky or oversized items are assigned specific storage zones to avoid congestion in the warehouse.					
Product Compatibility					
In our organization, compatible products are grouped together in storage to streamline the picking and packing process.					

In our organization, incompatible products are stored in separate areas to prevent damage or contamination.					
In our organization, the warehouse layout considers product compatibility to reduce picking errors and improve order accuracy.					

How else do you think product placement influences performance of distribution firms?

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Section C: Warehouse Flow

Please indicate your level of agreement with the following statements on warehouse flow and performance of distribution firms in Kenya. Please kindly tick (√) in the appropriate space that represents your opinion. Use the scale: Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5)

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Dispatching					
Our organization has a visual chart or diagram that shows the main					

activities of the warehouse					
A process flow illustrates how goods are received, the process they go through, how they are shipped, and any stages in between					
Am satisfied with the procedure followed when dispatching delivery goods in our organization					
Returns					
Our organization ensures there is free flow of goods and services to enhance warehouse operations					
Our organization has a specialized team to ensure effective warehouse performance					
Am satisfied with the effectiveness of warehouse returns in our organization					
Order picking					

Order picking is a key component of warehouse flow					
In our organization there is a procedural way of picking orders					
Am satisfied with the effectiveness of order picking methods in our organization					

How else do you think warehouse flow influences performance of distribution firms in Kenya?

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Section D: Retrieval Systems

Please indicate your level of agreement with the following statements on retrieval systems and performance of distribution firms in Kenya. Please kindly tick (√) in the appropriate space that represents your opinion. Use the scale: Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5).

Statements	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Information Systems					
Our organization has adopted information					

system for storage of information					
In our organization there is less paperwork hence efficiency of operations					
Am satisfied with the effectiveness information systems in our organization					
Input Systems					
Input systems is a key component of retrieval systems					
In our organization information is stored systematically					
Am satisfied with the effectiveness input systems in our organization					
Output system					
Output system is a key component of retrieval system in our organization					
Am satisfied with the effectiveness of output system in our organization					
Retrieval of information in our					

organization is done systematically					

How else do you think retrieval systems influence performance of distribution firms in Kenya?

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Section E: Warehouse Layout

Please indicate your level of agreement with the following statements on warehouse layout and performance of distribution firms in Kenya. Please kindly tick (√) in the appropriate space that represents your opinion. Use the scale: Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5)

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Distribution Centre Layout					
The layout of our distribution center effectively optimizes space utilization and facilitates efficient movement of goods					
The distribution center layout is conducive to streamlined inventory management processes, minimizing congestion and enhancing workflow efficiency					
Our distribution center layout supports					

easy accessibility to inventory, enabling quick retrieval and loading of goods for outbound shipments					
Fulfilment Center Layout					
The layout of our fulfillment center contributes significantly to the accuracy and timeliness of order fulfillment processes					
Our fulfillment center layout is designed to minimize order processing errors and enhance overall customer satisfaction					
The layout of our fulfillment center enables efficient picking, packing, and shipping of orders, leading to improved operational performance					
Cross-Docking Facility Layout					
Our cross-docking facility layout supports swift and seamless transfer of goods between inbound and outbound shipments					
The layout of our cross-docking facility enhances operational agility and responsiveness to					

changing customer demands					
Our cross-docking facility layout is optimized to minimize handling and storage times, resulting in improved efficiency and cost-effectiveness					

How else do you think warehouse layout and performance of distribution firms in Kenya?

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Section F: Firm Size

Please indicate your level of agreement with the following statements on firm size and performance of distribution firms in Kenya. Please kindly tick (√) in the appropriate space that represents your opinion. Use the scale: Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5).

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Small Enterprises					
Small enterprises demonstrate agility and adaptability in responding to market changes due to their streamlined					

organizational structure					
Small enterprises often face resource constraints, limiting their ability to invest in advanced technologies and infrastructure compared to larger counterparts.					
The size of our enterprise allows for direct and personalized communication channels, fostering stronger relationships with customers and suppliers.					
Medium-Sized Enterprises					
Medium-sized enterprises strike a balance between flexibility and stability, allowing for innovation while maintaining operational efficiency					
Medium-sized enterprises often					

possess sufficient resources to invest in technology upgrades and process improvements, contributing to their competitiveness in the market					
The organizational structure of medium-sized enterprises enables effective collaboration and coordination among departments, enhancing overall operational performance					
Large Enterprises					
Large enterprises benefit from economies of scale, allowing them to negotiate better terms with suppliers and achieve cost efficiencies in operations					
The size and scope of large enterprises enable significant investments in					

research and development, driving innovation and market leadership					
Large enterprises have the capacity to implement comprehensive quality control measures and standardized processes, ensuring consistent product/service delivery					

How else do you think warehouse layout influence performance of distribution firms?

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Section G: Performance of Distribution Firms

Please indicate your level of agreement with the following statements on performance of distribution firms. Please kindly tick (√) in the appropriate space that represents your opinion. Use the scale: Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), Strongly Agree (5).

	Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Inventory Turnover Rate					

Our firm maintains a high inventory turnover rate, indicating efficient management of stock levels and timely movement of goods through the supply chain					
The inventory turnover rate is closely monitored and optimized within our firm to minimize holding costs and reduce the risk of obsolete inventory.					
Our firm's inventory turnover rate reflects our ability to respond promptly to market demand fluctuations and ensure a continuous flow of products to customers..					
Order Fulfillment Accuracy					
Our firm prides itself on consistently achieving high order fulfillment accuracy, minimizing errors and enhancing customer satisfaction.					
We continuously strive to improve order fulfillment accuracy through process optimization and employee training programs,					

reflecting our commitment to operational excellence.					
On-Time Delivery					
Our distribution firm consistently meets or exceeds delivery deadlines, ensuring on-time delivery of orders to customers as promised					
We prioritize on-time delivery to uphold customer satisfaction and loyalty, leveraging efficient route planning and transportation management strategies					

Thank You for Participating

Appendix II: Factor Analysis for Construct Validity

Table 4. 21: Exploratory Factor Loadings (EFL)

	Product Placement	Initial	Extraction
	In our organization, frequently picked items are placed in easily accessible locations within the warehouse.	1	0.512
	In our organization, the warehouse layout is regularly adjusted based on changes in product pick frequency.	1	0.421
	In our organization, high-demand products are positioned closer to the dispatch area to reduce travel time during order picking.	1	0.619
	In our organization, products are stored based on their size and weight to ensure safety and ease of access.	1	0.432
	In our organization, heavy items are placed at lower storage levels to reduce handling risks and improve picking efficiency.	1	0.509
	In our organization, bulky or oversized items are assigned specific storage zones to avoid congestion in the warehouse.		0.513
	In our organization, compatible products are grouped together in storage to streamline the picking and packing process		
	In our organization, incompatible products are stored in separate areas to prevent damage or contamination		
	In our organization, the warehouse layout considers product compatibility to reduce picking errors and improve order accuracy.		
	STATEMENT		
	Warehouse Flow	**Initial**	**Extraction**
PDS1	Our firm employs innovation capability to improve productivity.	1	0.626
PDS 2	Our firm adopts innovation capability to improve brand recognition and value	1	0.450
PDS 3	Our firm employs product improvement to reduce production costs.	1	0.536
PDS 4	Our firm adopts product improvement for improvement and recognition of product brand.	1	0.524
PDS 5	Our firm employs concept development to increase sales.	1	0.482
PDS 6	Our firm utilizes concept development to solve design problems in our product/ service offering.	1	0.449
	STATEMENT		
	Retrieval systems	**Initial**	**Extraction**
MDS1	Our firm employs customer segmentation to develop deeper	1	0.623

	consumer insights (Know your customer).		
MDS 2	Our firm adopts customer segmentation to improve customer retention.	1	0.557
MDS 3	Our firm employs regional expansion to access to new markets.	1	0.515
MDS 4.	Our firm adopts regional expansion increase business growth.	1	0.499
MDS 5.	Our firm employs International expansion to be able to provide a reliable service to our international clients	1	0.473
MDS 6.	Our firm utilizes International expansion to access to a pool of potential workers with unique skill sets.	1	0.633

	STATEMENT		
	Warehouse Layout	**Initial**	**Extraction**
DS1.	Our firm employs concentric diversification to be able to utilize existing competencies and abilities to launch new products or services.	1	0.677
DS 2.	Our firmadopts concentric diversification to achieve synergy i.e. the ability of smaller departments/divisions to realise larger goals that can be impossible as separate entities.	1	0.495
DS 3.	Our firmemploys horizontal diversification to increase market share.	1	0.470
DS 4.	Our firm adopts horizontal diversification to create economies of scale.	1	0.516
DS 5.	Our firm employs conglomerate diversification to reduce the risks on loss.	1	0.504
DS 6.	Our firm utilizes conglomerate diversification to expand our customer base by opening the core company to new opportunities	1	0.422

	STATEMENT		
	Performance of Distribution Firms	**Initial**	**Extraction**
IC1.	Suppliers have power to determine the prices of the goods/services they supply us with.	1	0.668
IC 2.	Buyers have power to demand higher quality products.	1	0.441
IC 3.	New entrants create are competitors to current companies within an industry.	1	0.488
IC 4.	We minimize the threat of substitute products by creating unique product offerings that satisfy specific needs so customers are not easily swayed by substitute products.	1	0.525

IC 5.	We use competitive rivalry as a measure of the extent of competition among firms in the industry. Competitive rivalry impacts on profits, leads to price cutting, increased advertising expenditures, or spending on service/product improvements and innovation.	1	0.601

Appendix III: List of Distribution Firms in Kenya

1 GIFTLINE FREIGHT SERVICES LTD. NAIROBI 020-2044488
2 RUSINGA INT FREIGHT LTD. NAIROBI 556013
3 MURANGA FORWARDERS LTD. MOMBASA 020-220163
4 DOT. COM. CONSULTANTS CO. MOMBASA 041-2317030
5 PORTLINK LOGISTICS LTD. MOMBASA 041-2312660
6 DANJAM INVESTMENTS CO. LTD. MOMBASA 020-210781
7 MUSTAFA FREIGHT FORS LTD. NAIROBI 0722-207795
8 WOLFENBERG INTERNATIONAL NAIROBI 0728-896840
9 GISENYA FREIGHT LOGISTICS LTD. NAIROBI 6004424
10 AL-MUSTAQIM TRADING CO. (K) LTD. MOMBASA 722521587
11 PAMOL CONNECTIONS MOMBASA 0722-115124
12 MOHABAB ENTERPRISES LTD. NAIROBI 020-603784
13 VINEP FORWARDERS LTD. NAIROBI 2719002/3
14 DEEPMARK CARGO LTD. NAIROBI 020-2243961
15 METEOR FREIGHT FORWARDERS LTD. NAIROBI 020-557322
16 POLYGON LOGISTICS LTD. NAIROBI 020-822777
17 PINNACO LOGISTICS LTD. NAIROBI 0720-936058
18 TRADE HAUS & GLOBAL LOGISTICS MOMBASA 0724-504637
19 SIMPTONS EA. HOLDINGS LTD. NAIROBI
20 KENAFRIC INDUSTRIES LTD. NAIROBI 02055566-68
21 SEAWAY MARITIME LTD. NAIROBI 0722-317153
22 FAMO FORWARDERS LTD. MOMBASA 2311945
23 VISION ENTERPRISES LTD. NAIROBI 020-2340070
24 MIDSTAR FORWARDERS CO. LTD. MOMBASA 041-2229592
25 LOGWIN AIR AND OCEAN (K) LTD. NAIROBI 0727-574552
26 SUPER QUICK FREIGHTERS LTD. NAIROBI 0722-759914
27 PLAINLANDS INT FR LOGISTICS LTD. NAIROBI 020-343133
28 MESOHLINK LTD. NAIROBI 0722-345818
29 BLUE HILL INVESTMENTS LTD. NAIROBI 2219027
30 NIBAL FREIGHTERS LTD. MOMBASA 041-2234521
31 JIPE HOLDINGS LTD. NAIROBI 0722-529300
32 FREIGHTWELL EXPRESS LTD MOMBASA 041-2229784/6
33 GREENBELT LOGISTICS LTD. MOMBASA 041-2315810
34 GOLDEN FREIGHT SERVICES MOMBASA 041-2315810
35 PRINCIPAL FORWARDERS LTD. MOMBASA 2228448/2223482
36 BLUERANGE LOGISTICS LTD. NAIROBI 020-2603242
37 ROSAKAL INVESTMENTS LTD. MOMBASA 0722723956

38 PROVINCIAL C&F LTD. MOMBASA 2311245/6
39 ONGOING CARGO SERVICES LTD. NAIROBI 827271
40 ERI KENYA LTD. NAIROBI 041-2318101
41 BOLLORE AFRICA LOGISTICS (K) LTD. NAIROBI 6421000
42 BILATERAL SEMITE SAP LTD. MOMBASA 041-2222578
43 AL-AQMAR FORWADERS LTD. MOMBASA 2317742
44 FILMLINE LTD. NAIROBI 020-6006551
45 LAND BRIDGE FREIGHTERS MOMBASA 041-2222484
46 ANDY FORWARDERS SERVICES LTD. NAIROBI 827084
47 CALL FAST SERVICES LTD. NAIROBI 020-827684
48 SMART CHOICE SERVICES LTD. MOMBASA 0722-529328
49 PENTAGON FREIGHT FORD LTD. NAIROBI 0723-342390
50 POLO AUTO FREIGHT FORWARDERS MOMBASA 722976676
51 RIPE FREIGHT SERVICES LTD. MOMBASA 041-2227241
52 DAP LOGISTICS LTD. MOMBASA 041-2312229
53 ACTIVE FORWARDERS LTD. MOMBASA 041-2312141
54 THREEWAYS SHIPPING SERVICES LTD. MOMBASA 2317509
55 SINZA FREIGHT AND LOGISTICS MOMBASA 722390371
56 SUPERSONIC C&F SERVICES NAIROBI 651185/6/7
57 LUXYWAYS LTD. MOMBASA 721429202
58 FREIGHT WINGS LTD. NAIROBI 822085
59 SAMSY INTERNATIONAL NAIROBI 733777122
60 BAMBURI SHIPCHANDLERS (K) LTD. MOMBASA 041-2317295
61 AFRIFRESH CONVEYORS LTD. NAIROBI 725039660
62 DUTY LOGISTICS LTD. NAIROBI 720704195
63 KIAMBA CLEARING & FORWARDING NAIROBI 6534410
64 JOWAKA SUPER LINKS LTD. NAIROBI 020-2532729
65 TRIBERTOO (K) LTD. MOMBASA 041-222964
66 ALUJO ENTERPRISES CO. LTD. MOMBASA 722384653
67 URGENT CARGO HANDLING LTD. NAIROBI 2229567
68 GAMARA INVESTMENTS LTD. MOMBASA 041-2317740
69 TRANSOCEANIC P. DEV (K) LTD. MOMBASA 041-2319704
70 KENYA BONDED WAREHOUSE MOMBASA 2311577
71 SEALINE LOGISTICS LTD. NAIROBI 3504882
72 REPLAN CARGO HANDLING SERVICES MOMBASA 041-2319596
73 MWAMBA FREIGHT SERVICES LTD. MOMBASA 020-2630262
74 COMPLAST INDUSTRIES LTD. NAIROBI 020-2326227/8
75 NEW WIDE GARMENTS (K) EPZ LTD. ATHI RIVER 045-6626077
76 ALLIANCE LOGISTICS (K) LTD. NAIROBI 020-552817

77 HAPPY WORLD FREIGHTERS LTD. NAIROBI 020-3586138
78 FRANK AND GEOFFREY CARGO LTD. NAIROBI 020-3577703
79 EREMO STORES LTD. NAIROBI 4446046
80 REGIONAL ENTERPRENEURS (K) LTD. NAIROBI 722514335
81 FILIKEN TRANSIT FORWARDERS LTD. MOMBASA 2490291
82 SPEEDEX LOGISTICS LTD. NAIROBI 020-202077
83 GLOBAL BUSINESS COMMANDERS MOMBASA 041-2229381
84 MUZDALIFA C&F LTD. MOMBASA 041-2317012
85 VICTORY FREIGHTERS LTD NAIROBI 0722-600301
86 UNIGLOBE LOGISTICS MOMBASA 72696632
87 SIMCON FREIGHT LTD. MOMBASA 0733-383838
88 STEFRA CONSULTANCY AGENCIES NAIROBI 312220
89 FRA ALEX TOP FREIGHTERS LTD. NAIROBI 020-312220
90 REALTIME FREIGHT PERFORMANCE NAIROBI 0722-769725
91 INTL COMMITTEE OF THE RED CROSS NAIROBI 828220/1/2
92 AIR-CONNECTIONS LTD NAIROBI 020-2122194
93 LYNX LOGISTICS LTD. MOMBASA 2318600
94 SPEDAG INTERFREIGHT (K) LTD. MOMBASA 0722204245
95 SAMEDAY CARGO FORWARDERS LTD. NAIROBI 020-3617873
96 FREIGHT LOGISTICS LTD. NAIROBI 020-8096608
97 DANJOS INTERNATIONAL AGENCIES MOMBASA 0722103961
98 FREIGHT FORWARDERS (K) LTD. MOMBASA 2227573/5
99 RENAISSANCE LTD. ATHI RIVER 020651228
100 KEN-KNIT (K) LTD. ELDORET 053-2032644/5
101 AKAMAI FREIGHT FORWARDERS LTD. NAIROBI 0727298830
102 GULF CROSS LTD. MOMBASA 0722869761
103 EXCELLENT LOGISTICS LTD. NAIROBI 0202337024
104 EVERLAST ENTERPRISE LTD. NAIROBI 210472
105 SUPER FIRST FORWARDERS LTD. NAIROBI 828740
106 K. B. FREIGHTERS LTD. MOMBASA 041-2316292
107 SILICON FREIGHT INTL CO. LTD. MOMBASA 0722313424
108 SKYLIFT CARGO LTD. NAIROBI 828639
109 FREIGHT COMMANDOS LTD. NAIROBI 020-4454309
110 MABES ENTERPRISES LTD. MOMBASA 0722566749
111 RELIABLE FREIGHT SERVICES LTD. MOMBASA 041-2316714/5
112 TREASURE CARGO SERVICES LTD. NAIROBI 342211
113 JAMREKS ENTERPRISES MOMBASA 0722586052
114 LINK AFRIQUE (K) LTD. NAIROBI 826243
115 GENERAL FREIGHTERS LTD. NAIROBI 827354/7

116 TRACMI FREIGHTERS LTD. MOMBASA
117 CONVENTIONAL CARGO CONVEYORSLTD. NAIROBI 6537766/9
118 ASK CARGO LTD. NAIROBI 020-4444128
119 WORLD RHINE FORWARDERS LTD. NAIROBI 020-2466745
120 SUPERIOR CARGO CONVEYORS LTD. NAIROBI 020-827220
121 SUPER FREIGHT LTD. NAIROBI 0722708636
122 PANAL FREIGHTERS LTD. MOMBASA 2315068
123 TRIOSTAR AGENCIES (K) LTD. NAIROBI 020-2246754
124 NGOZI LTD. MOMBASA 0736735319
125 FREIGHT IN TIME LTD. NAIROBI 827248
126 IMENTI FREIGHT LTD. NAIROBI 020-2379510
127 SUNA FREIGHTERS SUNA 0722466262
128 FLOWERPORT LOGISTICS LTD. NAIROBI 0720-774520
129 COAST PROFESSIONAL FREIGHTERS MOMBASA 2496058
130 WANANCHI MARINE PRODUCTS LTD. MOMBASA 041-2220517
131 TRANSONIC LOGISTICS LTD. NAIROBI 072272182
132 TELLAM FREIGHT FORWARDERS LTD. MOMBASA 0722282322
133 AFRICA DIRECT LTD. NAIROBI
134 MODA FREIGHT FORWARDERS LTD. MOMBASA 2317818
135 UNIMAR LOGISTICS LTD. MOMBASA 2220165
136 FEDERAL FREIGHT & TRANSPORT NAIROBI 020-2098732
137 EYEBLINK FREIGHT MANAGEMENT MOMBASA 2319289
138 DECCAN FREIGHT LOGISTICS MOMBASA 041-2312020
139 SKYLARK CONVEYORS (K) LTD. NAIROBI 020-2240451
140 VENUS KENYA LTD. MOMBASA 020-8020469
141 CARGO NEST (K) LTD. NAIROBI 020-312964
142 ATACO FREIGHT SERVICES LTD. MOMBASA 2229634
143 OKAMOTO FREIGHT SERVICES LTD. NAIROBI 822198/2131075
144 STARWAY INTL F & FOWARDERS LTD. MOMBASA 0711104410
145 BAHARI FORWARDERS LTD. MOMBASA 22234098
146 KENVILLA LOGISTICS LTD. MOMBASA 0725258320
147 KENTAN CONNECTIONS LTD. MOMBASA 041-2227178
148 MUSTAFA MOHAMED ISSA LTD. MOMBASA 020-2314881
149 TRIPPLE TWIN LOGISTICS LTD. NAIROBI 020-2638896
150 WILLMON FREIGHT AGENCIES NAIROBI 0722731853
151 MENTAP RESOURCE FREIGHT LTD. NAIROBI 020-2495083
152 MAGNATE LOGISTICS LTD. NAIROBI 0722634150
153 FANTASHI FREIGHTERS & LOGISTICS NAIROBI 0722234824
154 ONWARD CARGO SYSTEM CO. LTD. NAIROBI 827170

155 F. Y. SIMBA SHIPPING AGENTS MOMBASA 2312377
156 INTRASPEED ARCPRO (K) LTD. NAIROBI 020-828502/3
157 ROLLING CARGO LTD. MOMBASA 041-2319663
158 CHARITIES LOGISTICS LTD. MOMBASA 041-2222451
159 GOLDFIELDS LOGISTICS LTD. NAIROBI 020-341114
160 BOLT SPEED CARGO FORWARDERS NAIROBI 0738413701
161 MANGO VISION FREIGHTERS LTD. MOMBASA XXXX
162 LLOYDS LOGISTICS LTD. MOMBASA 0723217490
163 TRANSFREIGHT LOGISTICS LTD. MOMBASA 041-3430265
164 TEOS COMPANY LTD. MOMBASA 041-224750
165 INTIME FORWARDERS LTD. NAIROBI 020-3545436
166 PRAFULA ENTERPRISES LTD. NAIROBI 020-2021204
167 KAISER AGENCIES LTD. MOMBASA 2223174
168 TROPICAL SKY CAEGO LTD NAIROBI 020-4454435
169 CAPRICON FREIGHT FORWARDERS MOMBASA 412316867
170 SEA LORD AGENCIES MOMBASA 0722654355
171 S AND L PORT SOLUTIONS LTD. MOMBASA 0722858274
172 CIRCLE LINES AGENCY LTD. NAIROBI 2241011
173 SEACON (K) LTD. MOMBASA 0722965852
174 ABAADILA ENTERPRISES LTD. NAIROBI 020-676219
175 BASELINE LOGISTICS (K) LTD. NAIROBI 0722381619
176 ZOMU LOGISTICS LTD. NAIROBI 0721360065
177 FAIR LOGISTICS AGENCY LTD. MOMBASA 0722353372
178 SAHARA CLEARING & FORWARDING NAIROBI 2217848/9
179 SEDO LOGISTICS LTD. NAIROBI 020-2333088
180 TRANSNET FREIGHT INTERNATIONAL NAIROBI 020-2141799
181 KENFREIGHT (E.A.) LTD. MOMBASA 236800/1/2
182 BECOZI INVESTMENTS MOMBASA 0722825703
183 KENYA DUTY FREE COMPLEX NAIROBI 827123/5
184 DIPLOMATIC DUTY FREE LTD. NAIROBI 827123/5
185 UNITED CLEARING COMPANY LTD. MOMBASA 041-2225882
186 BAKRIZ HOLDINGS LTD. MOMBASA 0722415352
187 MABATI ROLLING MILLS LTD. ATHI RIVER 020-6427000
188 MACSIM CARGO SERVICES NAIROBI 020-2248743
189 CONSOLIDATED (MSA) LTD MOMBASA 2494481/85
190 HAMBU FREIGHT SERVICES LTD. MOMBASA 2222850
191 ISSA CLEARING & FORWARDING CO. MOMBASA 041-2221619
192 PRECISE LOGISTICS LTD. NAIROBI 828060/1
193 AFRIQ FREIGHT SERVICES LTD. NAIROBI 020-2614511/12

194 FOX INTERNATIONAL LOGISTICS LTD. NAIROBI 827964/5
195 BLUE LIME LTD. NAIROBI 041-2315445
196 RED ANCHOR FR. FORWARDERS LTD. NAIROBI 020-2211418
197 BRUNSWICK FREIGHT LOGISTICS NAIROBI 020-8141816
198 SPEAR LOGISTICS (K) LTD. MOMBASA 041-2312919
199 WESTIN ENTERPRISES LTD. MOMBASA 041-2312021
200 OKIEK ENTERPRISES LTD. BUSIA 0716777229
201 NEO SEALAND REGIONAL FR. LTD. NAIROBI 2241384
202 KAVFREIGHT ENTERPRISES LTD. MOMBASA 0722424711
203 CHANNEL ATLANTIC LTD. MOMBASA 2318139
204 CROWN INDUSTRIES LTD. NAIROBI 020-6536876
205 BONFIDE C&f CO. LTD. NAIROBI 020-2043220/1
206 DAVIS & SHIRTLIFF LTD. NAIROBI 020-696800
207 UNCLE RIVERSIDE INVESTMENT LTD. MOMBASA 0722327439
208 VILLESSY AGENCY LTD. MOMBASA 020-3575366
209 EXCLUSIVE LOGISTICS (K) LTD. NAIROBI 020-2211216
210 OCEANSKY CLEARING AGENCY LTD. NAIROBI 020-2326226
211 DENALI LOGISTICS LTD. MOMBASA 041-2315480
212 FREIGHTMAX CO. LTD. NAIROBI 0722128128
213 JASPA FREIGHT LTD. NAIROBI 020-2428892
214 KELVIN AND HANNINGTON INTL LTD. NAIROBI 020-553628
215 CARMEL MOUNT FREIGHT LOGISTICS MOMBASA 041-2224366
216 NEPTUNE FORWARDERS NAIROBI 3004074
217 CENTRINO CARGO LTD. MOMBASA 0721572546
218 CLEARTECH LOGISTICS LTD. NAIROBI 0722964075
219 KENYA GENERAL INDUSTRIES LTD. MOMBASA 0733413301
220 MTAPANGA AGENCIES LTD. MOMBASA 2227430/1
221 EXXEM EXPRESS CARGO CO. LTD. NAIROBI 020-2246653
222 INTL COMMIERCIAL CO. (K) LTD. NAIROBI 340741/3
223 QUISSAN ENTERPRISES LTD. MOMBASA 041-2315504
224 SALMIR C&F CO. LTD. MOMBASA 828264
225 AFRICAIR MANAGEMENT & LOGISTICS NAIROBI 827536/7
226 EXCESS LUGGAGE LTD. NAIROBI 4453321
227 HELIX LOGISTICS LTD. NAIROBI 820391
228 UCHALE LOGISTICS LTD. NAIROBI 0723839109
229 PORTS FREIGHT SERVICES LTD. NAIROBI 820388
230 KIMAKIMWE LTD. NAIROBI 820393
231 PORTS LOGISTICS LTD. NAIROBI 820388
232 PORTS CONVEYORS LTD. NAIROBI 820388

233 SAHA FREIGHTERS LTD. MOMBASA 041-2317229
234 HASHI ENERGY LTD. NAIROBI 020-2215088
235 STEEL STRUCTURES LTD. NAIROBI 2405445/6
236 RELIANCE CARGO SERVICES NAIROBI 0722408278
237 VIBGYOR ENTERPRISES LTD. MOMBASA 0722881690
238 CONVEX COMMERCIAL LOGISTICS NAIROBI 0722996537
239 GREATSPAN MARITIME SERVICES LTD. MOMBASA 0733853734
240 GOOD FREIGHT INTERNATIONAL CO. NAIROBI 0724610767
241 JOPUKA LOGISTICS LTD. NAIROBI 0722669428
242 WESWORLD FR. & LOG SOLUTIONS NAIROBI 0722856535
243 MANTRACK AGENCIES NAIROBI 020-315902
244 KATE FREIGHT AND TRAVEL LTD. NAIROBI 6532020
245 HORIZON FREIGHT FORWARDERS LTD. NAIROBI 318772
246 WESTON LOGISTICS LTD. MOMBASA 2494604
247 WATER FRONT ENTERPRISES LTD. NAIROBI 0721241319
248 KAPRIC APPAREL LTD. MOMBASA 020-3501690
249 TEPRA LOGISTICS LTD. NAIROBI
250 CHASE FAST LOGISTICS LTD. NAIROBI 020-8047933
251 HASMAD CARGO LTD. NAIROBI 020-310902
252 STEJA GENERAL AGENCIES CO. LTD. MOMBASA 2222168
253 TOTAL TOUCH EXPRESS LTD. NAIROBI 822165/4/6
254 DALSAN FREIGHTERS LTD. MOMBASA 041-2229934
255 HOMELAND FREIGHT LTD. NAIROBI 6537732/5
256 WAMBUKA FREIGHTERS MOMBASA 041-2227919
257 SHARDI EXPRESS LTD. NAIROBI 020-318329
258 AAN CLEARING & FORWARDING LTD. MOMBASA 0733390249
259 AIRCOM CARGO LOGISTICS (K) LTD. NAIROBI 0723951130
260 CORNERSTONE LTD. NAIROBI 550474/5
261 GEOMWA EXPRESS CARGO LTD. MOMBASA 041-2315942
262 TEDICE EXPRESS AGENCIES LTD. NAIROBI 0722810754
263 MAKIWAN LOGISTICS LTD. NAIROBI 0722794232
264 S. K. AMIN LTD. MOMBASA 2223492
265 AEROPATH KENYA LTD. NAIROBI 0722845578
266 UNION C & F LTD. MOMBASA 2222913
267 PANTEL CHEMICALS LTD. NAIROBI 0732313129
268 ALI'S FREIGHT LTD NAIROBI 0733617229
269 SONEVA ENTERPRISES MOMBASA 041-2226079
270 FREIGHT POINT LTD. NAIROBI 041-2225002
271 DOSHI AND CO. HARDWARE LTD. MOMBASA 041-2224414

272 MARACA ENTERPRISES LTD. NAIROBI 822112
273 CAR AND GENERAL KENYA LTD. NAIROBI 020-554500
274 INTEGRATED LOGISTICS CO. NAIROBI 557347
275 WETSON EXPRESS MOMBASA 0722716675
276 KODAVI INVESTMENTS LTD. MOMBASA 0722382092
277 PAWEED EXPRESS CARGO NAIROBI 0724283506
278 INDIAN OCEAN F. (E.A.) LTD. MOMBASA 0727484638
279 CHINAKE INVESTMENTS LTD. MOMBASA 041-2319726
280 EDISA HOLDINGS (K) LTD. MOMBASA 0724700142
281 KUEHNE + NAGEL LTD. NAIROBI 020-6600000
282 DON SIMON LTD. MOMBASA 0722353311
283 AFFAIRES AFRIQUE LTD. NAIROBI 827460
284 KIND LOGISTICS LTD. MLOLONGO 0733558411
285 DUPLEX FORWARDERS LTD. MOMBASA 020-2663985
286 CONKEN CARGO FORWARDERS LTD. MOMBASA 0722410631
287 GLOBAL FREIGHT LOGISTICS NAIROBI 0422204344
288 DEJAS ENTERPRISES LTD. NAIROBI 0722731675
289 GENERAL CARGO SERVICES LTD. MOMBASA 0735411900
290 SUFIKE INVESTMENTS LTD. NAIROBI 0722750490
291 ALPINE TRADING LTD. MOMBASA 041-222082
292 LAXAT TRADERS LTD. MOMBASA 0706555577
293 AGILITY LOGISTICS LTD. NAIROBI 020-650292
294 SPRINT FREIGHT & LOGISTICS MOMBASA 0719316190
295 MORNING GLORY FREIGHT SERVICES MOMBASA 041-249559
296 KIMU FREIGHT AGENCIES LTD. MOMBASA 020-2408785
297 MOMBASA TIMES AFRICA LTD. MOMBASA 041-2319496
298 ONE LINK LTD. NAIROBI 020-2508861
299 LENBASE LOGISTICS LTD. NAIROBI 0720619648
300 NAMELOK HOLDINGS LTD. MOMBASA 0725272947
301 ALLCARGO GLOBAL LOGISTICS LTD. NAIROBI 0722820197
302 WORLD CLASS FRIEGHT LOGISTICS NAIROBI 020-2223782
303 DIGITAL CARGO FORWARDERS NAIROBI 020-2404331
304 CORRUGATED SHEETS LTD. MOMBASA 020-2023860
305 BIMA CLEARING AND FORWARDING NAIROBI 020-318815
306 SOIN CARGO HANDLERS LTD. MOMBASA 0722440975
307 MBARAKI PORT WAREHOUSES (K) LTD. MOMBASA 2229062/88
308 MEADOW AGENCIES LTD. MOMBASA 0733333180
309 BURHANI EXPRESS LOGISTICS LTD. NAIROBI 828450/1
310 BEYOND CHANCE FREIGHT SERVICES MOMBASA 0727283383

311 HIGHLANDS FORWARDERS LTD. NAIROBI 020-2447428/9
312 KENUGA ENTERPRISES MOMBASA 041-2222351
313 EXPRESS KENYA LTD. NAIROBI 3002371/2/3
314 DUME GENERAL AGENCIES LTD. MOMBASA 041-2222761
315 JORDAN FREIGHTERS LTD. MOMBASA 041-2007576
316 HORIZON EXPRESS CO. LTD. NAIROBI 559888
317 WORLD TRADE FREIGHT LOGISTICS NAIROBI 0722798804
318 EURASIAN FREIGHT FORWARDERS MOMBASA 041-2230298
319 RAPAT FREIGHT (K) LTD. NAIROBI 822222/822116
320 SEASKY FREIGHT AGENCIES LTD. NAIROBI 020-561820
321 GOHOMU AGENCIES MOMBASA 2226836
322 HARRY CARGO FRIEGHTERS LTD. MOMBASA 0622353536
323 RANK NETWORK LOGISTICS LTD. MOMBASA 0720321270
324 FRAMIC CARGO AGENCIES LTD. NAIROBI 6530048
325 BROOKEVALE INVESTMENTS LTD. MOMBASA
326 UNION LOGISTICS LTD. NAIROBI 3522391/2/3
327 LITTLE LEGENDS LTD. NAIROBI 020-2316055
328 C. K. ROTTUK LTD. MOMBASA 0706331441
329 LIBERTY FREIGHTERS LTD. NAIROBI 020-2217232
330 SOLSON CLEARING CO. MOMBASA 2490963
331 MARK RIECH AFRICA LIMITED MOMBASA 2222719
332 DAMCO LOGISTICS K LIMITED NAIROBI 828876/8
333 PRIORITY AIR EXPRESS LIMITED NAIROBI 0736748195
334 JAMBO TRADERS LIMITED MOMBASA 0412317166
335 GAMMA VILLA LIMITED NAIROBI 828276/8
336 AIRFLO LIMITED NAIROBI 66082562
337 PERLES SOLUTIONS MOMBASA 041-2317064
338 SKYTRAIN LIMITED NAIROBI 822038/822039
339 WANSAR KENYA LIMITED NAIROBI 020780858
340 SMOOTHLINE FREIGHTERS LIMITED NAIROBI 0722303143
341 SITE FORWARDERS LIMITED NAIROBI 2247596
342 KAMPALA JUBA FREIGHTERS LIMITED MOMBASA 041-2319170
343 INSTA PRODUCTS EPZ LIMITED NAIROBI 045-22961/2
344 KENTON FREIGHTERS NAIROBI 020-2362255
345 DELFAST LOGISTICS LTD. NAIROBI 0724253060
346 SAMBA ENTERPRISES LTD. MOMBASA 041-2414491
347 KENSCO BUSINESS SOLUTIONS LTD. NAIROBI 2240498
348 WAKI C&F AGENTS LTD. NAIROBI 3561622
349 SALIMOND FREIGHT SERVICES LTD. NAIROBI 2251014/224088

350 LOGISTICS FREIGHT LTD. NAIROBI 2246097
351 APPROVED LOGISTICS LTD. MOMBASA 0722650326
352 ALTCO LOGISTICS LTD. LOKICHOGGIO 0722381076
353 LABORATORY & ALLIED LTD. NAIROBI 8040306
354 PRIORITY LOGISTICS LTD. NAIROBI 020-3565281
355 FOCUS INITIATIVE IMP & EXPORT CO. NAIROBI 020-310468
356 BULE & SONS FREIGHT SERVICES NAIROBI 020-3575460
357 LEIGHNICKS CO. LTD. NAIROBI 020-2219873
358 GEMINI TRADING CO. LTD. MOMBASA 2311983/4
359 SAFREIGHT LTD. MOMBASA 4470802
360 ECS LOGISTICS (K) LTD. MOMBASA 2225801
361 OCEANIC CARGO AGENCY NAIROBI 2162516
362 PRIMCARGO AGENCIES LTD. NAIROBI 2247122
363 PLUMASON CO. TD. MOMBASA 2228001
364 KENYA AIRFORCE NAIROBI 0727901988
365 FREIGHT REACH SERVICES LTD. NAIROBI 020-2650301
366 BROADWAY EXPRESS LTD. NAIROBI 0733241888
367 PAN AFRICAN SYNDICATE LTD. MOMBASA 2312123/4/5
368 IMPEX FREIGHT LTD. NAIROBI 020-342179
369 MISHALE FREIGHTERS LTD. NAIROBI 020-555495
370 GARDEN FREIGHT LOGISTICS LTD. NAIROBI
371 BARENA E.A. LTD. NAIROBI 2685102
372 BUHAYRAH FREIGHTS LTD. NAIROBI 0722328140
373 LAMU LOGISTICS CO. LTD. MOMBASA 041-2008484
374 TOPLINE LOGISTICS LTD. NAIROBI 312430
375 BLUE STAR CARGO LTD NAIROBI 0721201133
376 INDUS LOGISTICS LTD. MOMBASA 0708774747
377 ADMIDO AGENCIES LTD. NAIROBI 020-2636292
378 HASS PETROLEUM KENYA LTD. NAIROBI 2760000
379 MAK CARGO HANDLING SERVICES MOMBASA 020-3549036
380 SHARAF LOGISTICS LTD. MOMBASA 041-2319365
381 BLUE STAR TOURS INTERNATIONAL MOMBASA 0720260800
382 ADELCUS AGENCIES (K) LTD. MOMBASA 0723303177
383 YEAR 2000 FREIGHTERS LTD. NAIROBI 3746466/8
384 DAVELINE NETWORK CO. LTD. MOMBASA 020-2054219
385 BARGAABA BUSINESS AGENCY NAIROBI 053-8010544
386 SEALINE FORWARDERS LTD. MOMBASA 041-2224429
387 AL-EMIR LTD. MOMBASA 2226830
388 DORIC ENTERPRISES LTD. NAIROBI 020-2422912

389 FREIGHT POWER LOGISTICS LTD. NAIROBI 020-8144120
390 WESTWINDS FREIGHT SERVICES LTD. NAIROBI 0721559589
391 MARITIME FREIGHT CO. LTD. MOMBASA 2220075/2226813
392 INTRASPAX FREIGHTERS NAIROBI 020-2219280
393 TUDOR SERVICES LTD. MOMBASA 041-2220849
394 EXPORT TRADING CO. LTD. NAIROBI 020-2860881
395 JAMKA AGENCIES LTD. NAIROBI 0722914865
396 SAHARRY LTD. NAIROBI 0721600010
397 BOGANI FREIGHT SERVICES LTD. NAIROBI 051-8006752
398 CONTINENTAL FREIGHTERS LTD. NAIROBI 2218619
399 CONTINENTAL LOGISTICS NETWORKS NAIROBI 2713018
400 MEPRO TRADE LTD. NAIROBI
401 ZANAA FREIGHT LTD. NAIROBI
402 FLOWERWINGS EXPRESS (K) LTD. NAIROBI 020-722777/8/9
403 TASTIC ENTERPRISES NAIROBI 020-554524
404 DIVERSE MARINE & AIR C&F SERVICES MOMBASA 041-2226272
405 GALAXY LOGISTICS LTD. MOMBASA 0720573677
406 DEL RAY CARGO SERVICES LTD. NAIROBI 224656
407 TRANSCARE SERVICES LTD. NAIROBI 020-827279
408 SEACROSS FREIGHTERS (EA) LTD. MOMBASA 0734411460
409 MULTICARGO FREIGHTERS MOMBASA 041-2319811
410 CASCADE SWIFT E.A. AGENCY LTD. MOMBASA 0724131289
411 RAYTEC ENTERPRISES LTD. NAIROBI 0724241888
412 AIR-WAGON CARGO MOVERS LTD. NAIROBI 020-828146
413 ARNOP LOGISTICS CO. LTD. MOMBASA 0721520120
414 DHL GLOBAL FORWARDING (K) LTD. NAIROBI 020-6925800
415 DAVKIT ENTERPRISES LTD. MOMBASA 0712228338
416 PILLAR FREIGHT FORWARDERS LTD. NAIROBI 020-2302627
417 MAKAMA ADVANCED LOGISTICS LTD. NAIROBI 0722849909
418 AIRFREIGHT & LOG WORLDWIDE LTD. NAIROBI 0722707904
419 MID AFRICA SERVICES LTD. NAIROBI 0722498644
420 SWIFT GLOBAL LOGISTICS LTD. MOMBASA 2224865/2311351
421 KAWAISON INTERNATIONAL LTD. NAIROBI 020-311052/3
422 ABBAS TRADERS LTD. MOMBASA 2316699
423 AGRIQUIP AGENCIES E.A. LTD. NAIROBI 652107/9
424 VASTERGUARD TRADING CO. LTD. NAIROBI 2212999
425 TRANSVAAL LOGISTICS LTD. MOMBASA 041-2002772
426 MANUFACTURERS & SUPPLIERS LTD. NAIROBI 554199
427 ABSOLUTE FR. SERVICES & LOGISTICS MOMBASA

428 FREVA LOGISTICS SERVICES NAIROBI 0722701614
429 SAHARA INTERNATIONAL LOGISTICS MOMBASA 041-2319954
430 GN CARGO KENYA LTD. NAIROBI 202311
431 STEMI INVESTMENT LTD. MOMBASA 041-2227514
432 SKY LINE GLOBAL SERVICES LTD. NAIROBI 2240017
433 CARGO WORLD CONVEYORSS LTD. NAIROBI
434 VIBRASI ENTERPRISES LTD. MOMBASA 0722426597
435 LAS AIRFREIGHT LTD. MOMBASA 0713424150
436 SEABASE SOLUTIONS LTD. MOMBASA 041-2222329
437 FREIGHT OPTIONS & SOLUTIONS NAIROBI 020-2011232
438 REALTIME LOGISTICS LTD. NAIROBI 0732910520
439 BEACON MOVERS (K) LTD. NAIROBI 020-2017075
440 RISING FREIGHT LTD. NAIROBI 820905/820906
441 RUATECH GLOBAL LOGISTICS LTD. NAIROBI 020-2011232
442 LIVERCOT IMPEX LTD. MOMBASA 2315635
443 TANDEM FREIGHT SERVICES LTD. MOMBASA 041-2319259
444 AL ASEEF IMPES LTD. MOMBASA 0722415202
445 ESTON DIAMOND LOGISTICS LTD. NAIROBI 020-4442394
446 ASHTON APPAREL EPZ LTD. MOMBASA 3434251
447 BESTFAST CARGO (K) LTD. NAIROBI 3540453/4
448 AL YUM HAULIERS LTD. MOMBASA 020-2107159
449 EXP CONSOLIDATION SERVICES (K) MOMBASA 2225801
450 HILLCONS ENTERPRISES CO. MOMBASA 0755661616
451 TRADEWINDS LOGISTICS LTD. NAIROBI 822866
452 MATSINGBERG C&F LTD. NAIROBI
453 REGENT FREIGHT SYSTEMS LTD. NAIROBI 0722565444
454 ALCORDIA LOGISTICS LTD. MOMBASA 0735673738
455 SEABRIDGE FORWARDERS LTD. MOMBASA 828753/4
456 DHANUSH FORWARDERS (K) LTD. MOMBASA 041-231654/5
457 TRANSPORT & LIFTING SERVICES LTD. NAIROBI 554822
458 SMELRALDO INVESTMENTS LTD. NAIROBI 020-31100
459 FEEDERLINK LOGISTICS LTD. MOMBASA 041-2223166
460 UMOJA RUBBER PRODUCTS LTD. MOMBASA 2224630/2228536
461 FASTLANE FREIGHT FORWARDERS NAIROBI 020-2457835
462 MARK ENTERPRISES LTD. NAIROBI 6000855
463 INTER PLANET C&F CO. LTD. MOMBASA 0722701824
464 AEROMARINE CARGO SERVICES LTD. MOMBASA 041-2222979
465 HEME FREIGHTERS MOMBASA 0722276499
466 EAST AFRICA CARGO LOGISTICS MOMBASA 041-2230213

467 UFANISI FREIGHTERS (K) LTD. MOMBASA 2225889
468 UNICON LOGISTICS NAIROBI 2245916
469 ICEBERG MOVERS ENTERPRISES NAIROBI 0722944456
470 INTL COMMODITY & FREIGHT CENTRE NAIROBI 312840
471 NNITO TRADING LTD. NAIROBI 020-2333107
472 LONGROCK ENGINEERING LTD. NAIROBI 38572278
473 CARGOCARE INTERNATIONAL LTD. NAIROBI 020-3517871
474 FOURSEAS CARGO LTD NAIROBI 020-2014652
475 HOMELINE CONSOLIDATION SERVICES MOMBASA 0721446329
476 SCHENKER LTD. NAIROBI 827240/827241
477 FREIGHTLOGIX KENYA LTD. NAIROBI 0202381160-2
478 ECHKEN AGENCIES MOMBASA 020-2408536
479 MAREBA EXPRESS CARGO NAIROBI 0720752255
480 G4S SECURITY SERVICES (K) LTD. NAIROBI 020-6982000
481 AGS WORLDWIDE MOVERS LTD. MOMBASA 0770513186
482 DHL WORLDWIDE EXPRESS NAIROBI 020-6925100
483 FELICLEARCON CO. LTD. NAIROBI 07227524308
484 MULTIPLE SOLUTIONS LTD. NAIROBI 020-8008809
485 KADMUS FREIGHT LOGIDTICS LTD MOMBASA 0722838219
486 SKYWAYS LOGISTICS LTD. NAIROBI 0720206745
487 OCEAN PACIFIC INTL LINES MOMBASA 2226888
488 ABBEZ TRADING CO. LTD. MOMBASA 041-2319121/2
489 KENYA VEHICLE MANUFACTURERS THIKA 020-2357736
490 SOUTHERN SHIPPING SERVICES LTD. MOMBASA 2227232
491 CARGODECK (EA) LTD. MOMBASA 2314228
492 CHWILE INVESTMENTS LTD. MOMBASA 041-2319206
493 THAKA LTD. NAIROBI 4453793/4
494 OASIS CARGO LOGISTICS LTD. MOMBASA 0721736132
495 TIBA FREIGHT FORWARDERS LTD. MOMBASA 041-2229934
496 CHASAH LOGISTICS LTD. MOMBASA 0724954322
497 BAHARI TRANSPORT CO. LTD. MOMBASA 041-2225063
498 MANAQUIM CARGO CO. LTD. NAIROBI 020-558844
499 GIRAFFEE FORWARDERS LTD. NAIROBI
500 KENREVY CARGO CONVEYORS MOMBASA 041-2315706
501 RUMAN LOGISTICS NAIROBI 020-558844
502 NAJMI CLEARING & FORWADING MOMBASA 2223728/2230343
503 JIHAN FREIGHTERS LTD. MOMBASA 2223939/2227093
504 THE MAIN MARITIME SHIPPING LTD. MOMBASA 0726816725
505 EURO ONE KENYA NAIROBI 4444696

506 CHAISO AGENCIES LTD. MOMBASA 041-2317117
507 CATESAM ENT. LTD. NAIROBI 020-2416555
508 DRENAL ENTERPRISES LTD. MOMBASA 020-2151258
509 SMART TRADERS LTD. MOMBASA 0733996663
510 SWIFTLINK FREIGHT SERVICES LTD. NAIROBI 020-827194
511 INLAND AFRICA LOGISTICS LTD. MOMBASA 041-2317647
512 ATLANTIC LOGISTICS INTERNATIONAL NAIROBI 0716216730
513 JOHN FLORENCE MARITIME SERVICES MOMBASA 020-2615905
514 ROSMIK TRADING CO. LTD. MOMBASA 0722343630
515 LYCHEEWOOD LTD. MOMBASA 0733996663
516 AINUSHAMSI MULTIPLE AGENCIES NAIROBI 2469210/9
517 SOKOTA INVESTMENTS LTD. MOMBASA 0720959061
518 KITAKA ENTERPRISES LTD. MOMBASA 0723178712
519 CHEBE FREIGHTERS LTD. MOMBASA 2222670
520 SHIPFREIGHT LOGISTICS LTD MOMBASA 0722106392
521 MIDLANDS FREIGHT LTD. NAIROBI 2318233
522 COASTLINE AGENCIES MOMBASA 0729898481
523 EMICA LOGISTICS LTD. NAIROBI 0711905541
524 MULTILINES INTERNATIONAL (K) LTD. NAIROBI 0204440815
525 ASP COMPANY LTD. NAIROBI 020-3533974
526 FERIDA ENTERPRISES LTD. MOMBASA 041-2317248
527 MORGAN AIR CARGO LTD. NAIROBI 827136
528 BIGTIMER AGENCIES LTD. NAIROBI 0722526327
529 BAYLAND FREIGHT AGENCIES LTD. MOMBASA 2314692
530 GHOMBA INTERNATIONAL AGENCIES NAIROBI 020-2340288
531 TRADEWINDS INTERNATIONAL CARGO NAIROBI 020-8163860/1/2
532 KAKSINGRI FREIGHT DEVELOPMENT MOMBASA 2199170
533 ZEFT FREIGHTERS NAIROBI 6760535
534 KIBS INVESTMENT LTD. ISEBANIA 0721718747
535 FERDINARD FREIGHT & FORWARDERS NAIROBI 0722139650
536 BIRDWELL VENTURES LTD. NAIROBI 0672922
537 KEYNOTE LOGISTICS LTD. NAIROBI 020-2240549
538 EAST MERCHANTS LOGISTICS NAIROBI 0724576334
539 MASCOT HOLDINGS LTD. NAIROBI 020-2662735
540 RAY-CARGO SERVICES LTD. NAIROBI 2247302
541 TECHFREIGHT LOGISTICS LTD. NAIROBI 327323
542 LOGISTICS SOLUTIONS CO. LTD. NAIROBI 041-2318090
543 MFANCO AGENCIES LTD. NAIROBI 041-2220617
544 JUWELLS TRADING CO. LTD. MOMBASA 041-2319937

545 SHIPSIDES & GENERAL SERVICES LTD. MOMBASA 710610050
546 TOPEN INDUSTRIES LTD. NAIROBI 555101
547 RAPID KATE SERVICES LTD. NAIROBI 0735600117
548 BLUESHED FREIGHTERS LTD. MOMBASA 0722275463
549 EFFECTIVE CARGO CONSOLIDATOR NAIROBI 2220403
550 MUHITO INVESTMENTS MOMBASA 041-2317237
551 MOLO FREIGHTERS LTD. MOMBASA 0722283535
552 MIDWAVE FREIGHTERS LTD. NAIROBI 020-650365/4
553 FORA LTD. MOMBASA 041-2313350
554 RORENE LTD. MOMBASA 0722733384
555 MUSTHAFA ENTERPRISES LTD. MOMBASA 2223293
556 DELMONTE (K) LTD. THIKA 020-2141600
557 THOR SERVICES LTD. NAIROBI 0728646735
558 DODHIA PACKAGING LTD. NAIROBI 5005530/1/2/3
559 CARGO POINT INTERNATIONAL LTD. NAIROBI 020-35665597
560 STAR RHOSE CO. LTD. NAIROBI 722997507
561 INVESCO CARGO SOLUTIONS LTD. NAIROBI 020-2248290
562 CHERSHIRE FREIGHT LTD. NAIROBI 020-2062761
563 MUCHEBA SERVICES MALABA 0722551122
564 CONTINENTAL CARGO SERVICES (K) NAIROBI 0722319201
565 KENYA HAULAGE AGENCY LTD. MOMBASA 0723107479
566 GEORINE AGENCIES LTD. MOMBASA 041-226308
567 NEOSERVE LOGISTICS LTD. NAIROBI 020-246329
568 HI SPEED FREIGHT SERVICES LTD. NAIROBI 020-827549
569 ROYAL ENERGY (K) LTD. MOMBASA 0729410780
570 NODOR KENYA EPZ LTD. ATHI RIVER 045-662292
571 JEDIMA TRADE AGENCIES LTD. NAIROBI 2014365
572 WILLING FREIGHT SERVICES LTD. NAIROBI 020-2394387
573 CONTILOGIC FORWARDERS LTD. NAIROBI 0723442867
574 NARCOL ALLUMINIUM ROLLING MILLS MOMBASA 2226317
575 ALFOST ENTERPRISES LTD. MOMBASA 041-2318339/40
576 REFCO FORWARDERS LTD. MOMBASA 2221070
577 LIFTCARGO LTD. NAIROBI 020-822035
578 LINO STATIONERS (K) LTD. NAIROBI 0722202136
579 LOGISTICS THREE SIXTY-FIVE LTD. MOMBASA 020-2616211/12
580 SIGINON FREIGHT LTD. MOMBASA 041-2314150
581 UNDERSEAS MERCHANTS NAIROBI 020-2351987
582 BEDI INVESTMENTS LTD. NAKURU 051-2212320/1/2
583 JEMI FREIGHT LTD. NAIROBI 020-2301551

584 PEJON FREIGHT MOVERS LTD. NAIROBI 020-3592750
585 KENMONT LOGISTICS LTD. MOMBASA 041-2319751
586 JAMKELL ENTERPRISES LTD. MOMBASA 041-2314492
587 NEW PLANET EXPRESS LTD. NAIROBI 020-2010504
588 PLAN FREIGHT LTD. NAIROBI 2222344/2222355
589 BATA SHOE CO. (K) LTD. LIMURU 020-2010620
590 GLOBAL ALLIANCE CONSULTANCY NAIROBI 0722766836
591 REJEIBY CLEARING & FORWARDING MOMBASA 0722410229
592 LOGISTICS LINK LTD. NAIROBI 0736262126
593 RUBY CLEARING & FORWARDING MOMBASA 0722567160
594 SANDEK AGENCIES LTD. MOMBASA 041-2223984
595 ALIMANN LOGISTICS LTD. MOMBASA 0711904408
596 CONSTANCE FREIGHT SERVICES NAIROBI 020-2244433
597 AL SHOG SYSTEMS LTD. MOMBASA 0714868484
598 WAY TO ASSOCIATES LTD. MOMBASA 041-2317277
599 JACKA AGENCIES NAIROBI 2224447
600 BESTFREIGHT CONVEYORS LTD. NAIROBI 3749400
601 TRADE BASE CO. LTD. NAIROBI 2348152
602 LINKAGE CONVEYORS LTD. MOMBASA 041-2223107
603 DALEXY FREIGHTERS LTD. NAIROBI 0725357578
604 TRANSLINK LOGISTICS LTD. MOMBASA 020-3561777
605 FEELS TIME COMPANY LTD. MOMBASA 041-2319318
606 AZUSA LTD. NAIROBI 311911
607 LIDAN ENTERPRISES LTD. MOMBASA 041-2221925
608 HOLLYWOOD FREIGHT AGENCIES LTD. NAIROBI 020-313775
609 LEMCO FREIGHT FROWARDERS LTD. NAIROBI 020-7123279
610 FOAM MATTRESS LTD. KISUMU 057-2024940/1
611 PREMIER FLOUR MILLS LTD. NAIROBI 6531313
612 PETRUT FREIGHT FORWARDERS LTD. MOMBASA 041-2223368
613 MARYMAC FREIGHT CO. MOMBASA 2229185
614 BRYSON EXPRESS LTD. MOMBASA 0722435040
615 BOSMAR C&F ENTERPRISES LTD. NAIROBI 020-2212906
616 FELIBEN INTERNATIONAL LTD. NAIROBI 3007475
617 DELACOM SERVICES CO. LTD. NAIROBI 020-2696300
618 CROSS OCEAN LTD. NAIROBI 020-2023046
619 PENTAGON LOGISTICS LTD. NAIROBI 020-2114023
620 ECU LINE KENYA LTD. MOMBASA 041-2311563
621 EMPIRE LOGISTICS SERVICES LTD. NAIROBI 020-652372
622 JOMWAKI CARGO SERVICES LTD. NAIROBI 0722899493

623 TRANSVISTA FREIGHT LTD. NAIROBI 2343540
624 PAK PACIFIC LTD. MOMBASA 0722827918
625 SKYMAN FREIGHTERS LTD. MOMBASA 0722873185
626 NICAH LOGISTICS MOMBASA 0733331081
627 AWAYTO EAST AFRICA FR. LOGISTICS NAIROBI 020-2261344/5
628 SAMPHY LOGISTICS SERVICES NAIROBI 0724542614
629 ADAIR FREIGHT SERVICES LTD. NAIROBI 827496/827912
630 GOLDEN SPARROW FREIGHTERS LTD. NAIROBI 0722336502
631 KANKAM EXPORTERS LTD. NAIROBI 020-2391213
632 WIGGLESWORTH EXPORTERS LTD. MOMBASA 2225244/2220642
633 ELMON AGENCIES MOMBASA 0723814181
634 GIFCO KENYA LTD. MOMBASA
635 MILESTONE IMPORT & EXPORT LTD. NAIROBI 0204180482
636 BENAIRS LOGISTICS LTD. NAIROBI 020-2385329
637 QUEENS CARGO INTERNATIONAL LTD. NAIROBI 020-559472
638 SEAGATE LOGISTICS LTD. MOMBASA 0722632292
639 MOMBASA COFEE LTD. MOMBASA 041-2312948/9
640 BENELI FREIGHTERS LTD. MOMBASA
641 ROTO MOULDERS LTD. NAIROBI 020-3507850
642 MILLEAGE ENTERPRISES LTD. NAIROBI 020-2044839/41
643 AMAZON FREIGHT LTD. NAIROBI 2056494
644 INCOTERMS LOGISTICS SOLUTIONS (K) MOMBASA 0722735475
645 GENERAL MOTORS E.A. LTD. NAIROBI 020-6936111
646 PAN AFRIQUE FORWARDERS LTD. MOMBASA 041-2228984
647 PHILSAM AGENCIES LTD. NAIROBI 343749/343978
648 UNITED FREIGHT LOGISTICS NAIROBI 822829
649 SYLLER IMPRESS CO. LTD. MOMBASA 2319707
650 SOPA CARGO SERVICES LTD. NAIROBI 020-2158061
651 RAI PLYWOOD (K) LTD. ELDORET 053-2062222
652 KELIMA FORWARDERS LTD. KAMURIAI 0724264110
653 RAMSFORD FREIGHT FORWARDERS NAIROBI 020-2663417
654 GATEWAY MARINE SERVICES LTD. MOMBASA 0716430902
655 LOW SEA INTERNATIONAL AGENCIES MOMBASA 041-2225444
656 VID FREIGHTERS LTD. NAIROBI 020-2517095/6
657 SPART FREIGHT LOGISTICS LTD. MOMBASA 041-2317079
658 CARJET KENYA LTD. NAIROBI 310932
659 PALM FREIGHTERS LTD. MOMBASA 041-2314098
660 LIMUTTI HOLDINGS LTD. MOMBASA 2222238
661 BEYOND AFRICA FREIGHTERS LTD. NAIROBI 020-2728327/9

662 DELTA EXPRESS MOMBASA 0725278125
663 JOSIM AGENCIES LTD. MOMBASA 0722537085
664 JAGOMA LOGISTICS LTD. MOMBASA 041-2225552
665 THAM EXPRESS LTD. NAIROBI 020-3500866
666 SUMMIT COVE LINES CO. LTD. MOMBASA 020-3501248
667 REALTIME CARGO LTD. NAIROBI 020-2017735
668 RIDGEWAYS MERCHANTS LTD. NAIROBI 020-311830
669 UNITED ARYAN EPZ LTD. NAIROBI 2396197/8
670 KEARSLEY FREIGHT SERVICES LTD. NAIROBI 0735-202456
671 NEW WAY INTL FORWARDERS MOMBASA 041-2319690
672 BEST WING CARGO LTD. NAIROBI 020-827388
673 BEACH LINES LTD. NAIROBI 4185053
674 PEERLESS TEA SERVICES LTD. MOMBASA 2221396
675 RYCE EAST AFRICA LTD. NAIROBI 6531786/6
676 GEOTROMAC AGENCIES LTD. NAIROBI 0722694193
677 MARICHOR MARKETING SERVICES ELDORET 053-2062804
678 ALIBHAI RAMJI (MSA) LTD. MOMBASA 224702
679 CHAI WAREHOUSING LTD. MOMBASA 020-2033676
680 CEBIT CARGO LTD. NAIROBI 020-8076812
681 MUNSHIRAM INTL BUS MACHINES NAIROBI 532323/4
682 QUICKSAVE AGENCIES LTD. NAIROBI
683 WARTON AGENCIES LTD. NAIROBI 0722799339
684 BARKI INTERNATIONAL ENERGY (K) NAIROBI 2730003/8/9
685 ACTIVE CARGO SERVICES LTD. MOMBASA 0722603071
686 TURNER FREIGHT LTD. MOMBASA 0712480641
687 FAST CARGO MASTERS (K) LTD. MOMBASA 041-2318709
688 EAST AFRICAN CHAINS LTD. NAIROBI 6531376/9
689 NEXUS QUICK SERVICES NAIROBI 0720707948
690 PAN AFRICA LOGISTICS LTD. MOMBASA 041-2319715/6
691 ALPHA IMPEX LOGISTICS NAIROBI 827828
692 MRIS AGENCIES LTD. NAIROBI
693 CERTIS CO. LTD. NAIROBI 020-312433
694 GREEN ISLAND SHIPCHANDLERS (K) MOMBASA 2222993/2311096
695 LINKON INVESTMENTS LTD. NAIROBI 020-8098292
696 MAGNEX LTD. MOMBASA 041-2311521
697 AIR GO CONSULTANTS LTD. NAIROBI 827077
698 ALPHA LOGISTICS (K) LTD. NAIROBI 825481
699 MITCHELL COTTS FREIGHT (K) LTD. MOMBASA 2225509/2315780
700 KINGS CARGO AGENTS LTD NAIROBI 0724311639

701 INSPIRE AFRICA LOGISTICS LTD. MOMBASA 0720256762
702 IMPEX LOGISTICS LTD. MOMBASA 0729393200
703 BAYONNE FREIGHT FORWARDERS MOMBASA 0722221736
704 AL-ITIGAN INVESTMENTS CO. LTD. MOMBASA 020-2038689
705 VEROM C&F CO. LTD. MOMBASA 0720839414
706 PORTWAY (EA) LTD. NAIROBI 0728577770
707 NAFNET LOGISTICS LTD. NAIROBI 0722326332
708 ARCHIECRAFT HOLDINGS LTD. MOMBASA 020-25993472
709 INTERPORT CLEARING SERVICES LTD. NAIROBI
710 INTERKEN ENTERPRISES LTD. NAIROBI 020-2107133
711 SEALAIR FREIGHT LTD. NAIROBI 2250954
712 SAA INTERSTATE TRADERS (K) LTD. MOMBASA 020-2038689
713 CAMDEL EXPORT & IMPORT NAIROBI 313383
714 BLUE PLUS TEXTILES LTD. NAIROBI 0713765571
715 FORESTER FORWARDERS NAIROBI 0722637578
716 OPTIMAX AGENCIES LTD. NAIROBI 828115
717 SAHEL FREIGHTERS LTD. MOMBASA 2226089
718 MTUDAWA FREIGHTERS LTD. MOMBASA 041-2319493
719 FREIGHTCARE LOGISTICS LTD. MOMBASA 0722798036
720 ALEXANDRIA FREIGHT FORWARDERS NAIROBI 2243542
721 VICTORIA INTERNATIONAL LOGISTICS NAIROBI 020-551142
722 KESA LOGISTICS LTD. MOMBASA 0733136000
723 VICTORY FREIGHT SERVICES MOMBASA 041-2225708
724 QUICK CARGO SERVICES NAIROBI 020-552372
725 TECHNO RELIEF SERVICES LTD. NAIROBI 0722200539
726 EXPOLANKA FREIGHT LTD. NAIROBI 020-2437861/2
727 CORONET CARGO LTD. NAIROBI 2240485
728 PESOSI FREIGHTERS LTD. MOMBASA 2220966
729 OCEAN STAR GENERAL AGENTSLTD. MOMBASA 0720864475
730 EAST GLOBAL LOGISTICS (K) LTD. MOMBASA 0722224629
731 BELL LOGISTICS SERVICES NAIROBI 020-3588901
732 SPERANZA INTERNATIONAL LTD. NAIROBI 0721739329
733 NATALYA HOLDINGS CO. LTD. MOMBASA 2222832
734 GRACE REMOVALS LTD. NAIROBI 020-2062844
735 WORLDNET FREIGHT LTD. NAIROBI 020-2107081
736 DELTA HANDLING SERVICES LTD. NAIROBI 0722870187
737 REMOVAL GOODS SERVICES (K) LTD. NAIROBI 020-8067416
738 KEIHIN MARITIME SERVICES MOMBASA 041-2230349
739 SABINA LOGISTICS LTD. MOMBASA 041-2227832

740 AIRBAND CARGO FORWARDERS LTD. NAIROBI 020-2218468
741 DANSAF LOGISTICS LTD. NAIROBI 0722773598
742 SEAWAYS KENYA LTD. NAIROBI 3872660
743 RUFAIDA ENTERPRISES MOMBASA 0722727312
744 SAM AND SAN LOGISTICS NAKURU 0721967212
745 CARGOMAX FREIGHTERS LTD. MOMBASA 0722637021
746 KENYA WINE AGENCIES NAIROBI 020-4979000
747 KIPTEBEES FREIGHTERS LTD MOMBASA 0722856605
748 SYNERGY FREIGHT & LOGISTICS LTD. MOMBASA 020-261241
749 ZAHA LOGISTICS LTD. MOMBASA 0720214434
750 LOGENIX INTERNATIONAL LTD. NAIROBI 2218249
751 INTERGRID BUSINESS SOLUTIONS LTD. NAIROBI 020-6829226
752 ALOYS AND ROY FREIGHT SYSTEM NAIROBI 020-318950
753 MESHARRY FREIGHT FORWARDERS NAIROBI
754 TOTAL PLUS BUREAU CO. LTD. NAIROBI 827673
755 SWIFT ROYAL CONVEYORS MOMBASA 041-2230470
756 DIFAM FREIGHT LTD. BUSIA 05522127
757 GOODMAN INTERNATIONAL LTD. NAIROBI 4446684/85/86
758 INTIME FR & CARGO SERVICES CO. NAIROBI 0722300685
759 CARGOWORX KENYA LTD. NAIROBI 828069
760 KEVIAN KENYA LTD. NAIROBI 020-3870375
761 GOSHEN INTERNATIONAL LTD. MOMBASA
762 KIMCLEAR ENTERPRISES NAIROBI 827673
763 WISEWAY FREIGHTERS LTD. NAIROBI 020-3589639
764 TRANSNORTH LOGISTICS LTD. MOMBASA 0729393200
765 BAYPORT FREIGHTERS NAIROBI 0722834326
766 COAST SEABED FREIGHTERS MOMBASA 0722796179
767 INTERCITIES FREIGHT & SHIPPING LTD. NAIROBI 343483
768 SHREEJI FORWARDERS LTD. NAIROBI 6824152
769 BLUE SEAL FREIGHTERS NAIROBI
770 DAHLA KENYA LTD. MOMBASA 041-231738/39
771 WESTERN LOGISTICS SERVICES NAIROBI 828449/50
772 M.J. CLARKE LTD. MOMBASA 2226114
773 BLACKBOX (K) LTD MOMBASA 0727658648
774 SISCO SUPERIOR CAR HANDLING NAIROBI 020-249131
775 FLEET FREIGHTERS NAIROBI 2216167
776 GREAT ANCHOR CARGO LTD. NAIROBI 828161
777 WETAA INVESTMENTS LTD. MOMBASA 041-225584
778 THE NAIROBI CLEARING HOUSE (EA) NAIROBI 020-2363159

779 NORTH WEST (K) LTD. MOMBASA 041-2313978
780 BLUE WAVES LOGISTICS LTD. NAIROBI 0736600133
781 DODWELL AND CO. (E.A.) LTD. MOMBASA 2230060
782 TIMSALES LTD. NAIROBI 6532277
783 RISALA LTD. MOMBASA 2223815/25
784 SOLLATEK ELECTRONICS (K) LTD. MOMBASA 020-3501671/2
785 SAI CARGO MASTERS LTD. NAIROBI 0722890056
786 LANSEAIR LTD. NAIROBI 020-6004272
787 P. N. MASHRU LTD. MOMBASA 020-2040526/7
788 LOGISTICS SERVICES LTD. MOMBASA 0731104149
789 ARMCO (K) LTD. NAIROBI 4444628
790 CRUCIAL CARGO MOVERS NAIROBI 22441104
791 ANKIN COMMERCIAL AGENCY MOMBASA 0729972509
792 MILLENIUM AVAITION SERVICES MOMBASA 2230387
793 AMER TRADERS LTD. MOMBASA 0713288651
794 GIMBO FREIGHT LTD. NAIROBI 0722691280
795 PATANA ENTERPRISES LTD. MOMBASA 0721240557
796 QUATAR FREIGHT LOGISTICS NAIROBI 0710682221
797 KENYA GRANGE VEHICLE INDUSTRIES NAIROBI 3914000
798 MNET STARS LTD. MOMBASA 020-8008966
799 PEARL LOGISTICS LTD. KAMURIAI 055-54010
800 INTERNATIONAL FOREIGN TRADE CO. NAIROBI 4443977
801 TABAKI FREIGHT SERVICES LTD. NAIROBI 020-2459575
802 OCEAN HARVEST AND LOGISTICS LTD. MOMBASA 2225038
803 COLOSSUS FREIGHT LTD. MOMBASA 0720292835
804 CARGO FRONT INTERNATIONAL LTD. NAIROBI
805 UNITED (E.A.) WAREHOUSES LTD. MOMBASA 2315744
806 LANDMARK FREIGHT SERVICES LTD. NAIROBI 0724610767
807 OCEANLINE FREIGHT FORWARDERS NAIROBI 533482/555761
808 SEAGATE FREIGHTERS LTD. MOMBASA 041-2224973
809 KENYA AIRWAYS LTD. NAIROBI 6423156/3240
810 ZOUNHAIZE (K) NAIROBI
811 RUKEN FREIGHT LTD. NAIROBI 0722840694
812 DESTINY FR HANDLING P & CLEARING SERVICES NAIROBI 0722880556
813 BRIDGECO INTERNATIONAL LTD. NAIROBI 0722880556
814 JUATECH AGENCIES NAIROBI 020-6002625
815 STRAIGHT LINE CARGO FORWARDERS NAIROBI 020-2018537/8
816 JAMES FINLAY MOMBASA LTD. MOMBASA 041-2224057
817 TNT EXPRESS WORLDWIDE KENYA NAIROBI 0703052000

818 MVITA FREIGHT LTD MOMBASA 041-2315845
819 TRADEWISE AGENCIES LTD. NAIROBI 0713158066
820 CONVOY CARGO LOGISTICS MOMBASA 041-2004815
821 FOOD CHAIN E.A. LTD. MOMBASA 0721695141
822 SILVER ANCHOR FREIGHTERS LTD. MOMBASA 0722710766
823 KENKAL SHIP & GEN CONTRACTORS MOMBASA 041-2220007
824 KIPKEBE LTD. MOMBASA 020-8070430
825 SAJA FREIGHT LINER LTD. MOMBASA 0711762046
826 SAGITTARIUS TRADING LTD. NAIROBI 6005515
827 CHAIRMAN HOLDING LTD. NAIROBI 0722708498
828 THE HEARTLAND TRADING CO. MOMBASA 041-2313369
829 ARAMEX KENYA LTD. NAIROBI
830 ANYTIME CLEARING & FORWARDING MOMBASA 041-2224966
831 A.M.A. AL AMMARY LTD. MOMBASA 0722411489
832 GLADIN LOGISTICS (K) LTD. MOMBASA 0736810922
833 MONSOON MOVERS' ENTERPRISES LTD. NAIROBI 0720391255
834 VALUE CARGO LTD. MOMBASA 0720761998
835 SLEEK INTERNATIONAL LTD. MOMBASA 0722865151
836 MIG FORWARDERS LTD. NAIROBI 0722466262
837 PEDWIN GEN CONTRACTORS & RENOVATORS LTD. NAIROBI 0722660531
838 SPEEDWAY CARGO FORWARDERS LTD. NAIROBI 0722511205
839 WEKALAMBA AGENCIES LTD. MOMBASA 041-2317387
840 VISAN FREIGHT AGENCIES MOMBASA 2496030
841 AFRIQUE SHIPPING SERVICES LTD. NAIROBI 0725786437
842 BORA FREIGHTERS LTD. NAIROBI 020-318001/3
843 BRAVILLE AGENCY LTD. MOMBASA 2496030
844 STECA FREIGHT FORWARDERS CO. NAIROBI 020-2148690
845 EURONIP LTD. NAIROBI 0722521717
846 APEX STEEL LTD. MOMBASA 041-2226471
847 KANDITO FREIGHT AGENCIES MOMBASA 0720851866
848 MAGOT FREIGHT SERVICES LTD. MOMBASA 222189
849 SIVORINE (K) LTD. MOMBASA 041-2226052
850 MARUNI PRODUCTS CO. LTD. MOMBASA 041-2319973
851 TERYANI AGENCIES LTD. MOMBASA 0720938100
852 MUCH MORE C&F LTD. NAIROBI 2229822
853 TURNING POINT FREIGHT LTD. MOMBASA 2226156
854 SONDEKA FREIGHT FORWARDERS LTD. NAIROBI 020-2212126
855 WILDAN CLEARING & FORWARDING NAIROBI 0722324447
856 FIRST OPTIC SOLUTIONS NAIROBI

857 DELTA CARGO CONNECTIONS 2011 NAIROBI 0722718358
858 UKWALA FREIGHT FORWARDERS NAIROBI 0722525167
859 ONE TOUCH CARGO SERVICES NAIROBI
860 GALAHANJI CARGO SERVICES LTD. NAIROBI 020-2660043
861 MAST INVESTMENTS CO. LTD. MOMBASA 041-2227832
862 RIFT CARGO HANDLING LTD. NAIROBI 020-822594
863 OTOX MAWEZO LTD. MOMBASA 0725437669
864 TRADEBIZ FORWARDERS LTD. MOMBASA 041-2319779
865 LEENA APPARELS LTD. MOMBASA 434314
866 FAIDA CARGO SERVICES LTD. NAIROBI 020-6002995
867 KIMNET AGENCIES MOMBASA 0722721994
868 TRADELINE EXPRESS (K) LTD. NAIROBI 020-553050
869 AIRMARITIME (K) LTD. NAIROBI 020-896625
870 MUMILO FREIGHTERS LTD. MOMBASA 041-2226526
871 THE NOAHS ARK ENTERPRISES NAIROBI 601993/603616
872 UNION EXPRESS LTD. NAIROBI 828645/6
873 CHIRO HEIGHTS INVESTMENTS NAIROBI 0722738794
874 RIANAB LOGISTICS LTD. NAIROBI 0722749213
875 STEFRAH AGENCIES MOMBASA 041-2318360
876 SEMATI STORES ENTERPRISES MOMBASA 041-2317012
877 EVOLVE HOLDINGS LTD. NAIROBI 0722212455
878 MOMBASA LOGISTICS LTD. MOMBASA 041-22205321
879 VERODAH FR. & LOGISTICS CO. LTD NAIROBI 020-312201
880 PWANI OIL PRODUCTS LTD MOMBASA 041-2495563
881 GROUPEX EAST AFRICA LTD NAIROBI 041-23122173
882 SKYWARD INTL FR. FORWARDERS NAIROBI 020-2514022
883 CORPORATE AVIATION LTD NAIROBI 020-827157
884 DREAMLINE FREIGHTERS E.A. LTD MOMBASA 0723647733
885 LEAPTRACKS KENYA LTD MOMBASA 0724002529
886 ARPI LTD NAIROBI 020357173
887 MUGENGA HOLDINGS LTD MOMBASA 041-2319631
888 MAYA DUTY FREE LTD NAIROBI 020-2107141
889 KENTAN SERVICES LTD NAIROBI 020-789924
890 MARKENS FREIGHT LOGISTICS MOMBASA 0723600835
891 SIMMONDS CARGO SERVICES LTD NAIROBI 0206003305
892 SAHUSA FREIGHTERS LTD MOMBASA 0721397018
893 EMOTEL KENYA LTD MOMBASA 0722610149
894 INTERNET TRADE CONVEYORS MOMBASA 041-2224235
895 AIRBRIDGE FREIGHT FORWARDERS NAIROBI 020-311201

896 AIRMARINE CONVEYORS (K) LTD. NAIROBI 0732969423
897 BAABZ FREIGHT FORWARDERS LTD. MOMBASA 0720378714
898 BEEKAY LOGISTICS LTD. MOMBASA 0701899977
899 BLITZ LOGISTICS LTD. NAIROBI 0726873219
900 CULZENBERG FORWARDERS LTD. NAIROBI 0725528667
901 HIMA FREIGHT FORWARDERS LTD. NAIROBI 020-310902
902 IKONGO FARMS LTD. MOMBASA 041-2317301
903 CARGOLOG EAST AFRICA LTD. MOMBASA 0722345645
904 VIBGYOR FREIGHT SERVICES LTD. MOMBASA 0722827860
905 SPARTAN LOGISTICS LTD. NAIROBI 0202610267
906 VISHAMMAH ENTERPRISES LTD. MOMBASA 0720291443
907 MOLINS FORWARDERS LTD. NAIROBI 0734942096
908 ACCESS AFRICA LOGISTICS LIMITED NAIROBI 313808
909 INFUSION LOGISTICS (K) LIMITED NAIROBI 0722338626
910 COUNTY CLEARING& FORWARDING NAIROBI 0726300002
911 CARIBBEAN FREIGHT LTD. NAIROBI 020-2597596
912 PORTLINK HOLDINGS LTD. NAIROBI 0716657207
913 TEKOL HOLDINGS (K) LTD. MOMBASA 020-2593550
914 ZULA GLOBAL DEVELOPMENT LTD. MOMBASA 041-2315029
915 FAST CARGO MOVERS CO. LTD. MOMBASA 041-2317740
916 DOSAT FORWARDERS LTD. MTWAPA 0722175255
917 MARITIME LOGISTICS LTD. MOMBASA 0722701824
918 PRIME CATCH LOGISTICS (K) LTD. NAIROBI 0726594639
919 MUPEKI HAULIERS LTD. MOMBASA 0722319313
920 DERICKS CARGO LOGISTICS MOMBASA 0721227008
921 WAL QUICK HOLDINGS CO. LTD. NAIROBI
922 SPRING LOGISTICS LTD. MOMBASA 0722670066
923 INTERSPEED LOGISTICS LTD. MOMBASA 0722935636
924 SEAROCK FREIGHT & LOGISTICS LTD. MOMBASA 0713180988
925 KWAME FREIGHT LOGISTICS LTD. MOMBASA
926 OCEANROCK LOGISTICS LTD. MOMBASA 0717-019160
927 DAMINT FORWARDERS LTD. MOMBASA 0732680340
928 ORIENTAL EXPRESS FORWARDERS NAIROBI 0721958088
929 EASTHAL LOGISTICS LTD. MOMBASA 0724283546
930 WORLD DOMAIN LTD. NAIROBI 0733235387
931 GALAD ENTERPRISES LTD. NAIROBI 0714484756
932 CARGOMAX LTD. NAIROBI 0729700046
933 LIBAAN LTD. MOMBASA 0721545467
934 GREEN LEAF TRADING CO. LTD. MOMBASA 0733606057

935 FARIHMA TRADING CO. LTD. MOMBASA 0723558948
936 MASTERPIECE COURIERS SERVICES NAIROBI 2045043
937 RICA LOGISTICS LTD. MOMBASA 0722298745
938 TRADEPULSE (K) LTD MOMBASA 2567160
939 SUPERWISE FREIGHTERS LTD. MOMBASA 0722260460
940 CARGO WORLD LOG TRANSPORT LTD. MOMBASA 041-2319121
941 YURAI INVESTMENTS LTD. MOMBASA 0728161678
942 JOVAMA ENTERPRISES LTD. MOMBASA 041-2317012
943 DAVCHARL LOGISTICS LTD. MOMBASA 0733370096
944 BLUE LOGISTICS LTD. MOMBASA 0723673649
945 LILY LOGISTICS LTD. MOMBASA 0721413140
946 SASI FREIGHT SERVICES LTD. MOMBASA 0722684742
947 DANROS (K) LTD. MOMBASA 0723828181
948 HANGOOL INVESTMENT GROUP LTD. NAIROBI 0722111219
949 EXROL FREIGHT LTD. MOMBASA 041-2220501/2
950 INTER LOGISTICS LTD. NAIROBI 020-3503366
951 CEDAR CARGO LTD. NAIROBI
952 FOURSEAS INTERNATIONAL LTD. NAIROBI 0722843693
953 SUPREME OUTLETS LTD. MOMBASA 0723459159
954 BEMMS LTD. MOMBASA 0722471025
955 ZUKHRUF (K) LIMITED NAIROBI 0722741439
956 DAWA LTD. NAIROBI 3569904
957 DREAMLINE FREIGHTERS E.A. LTD. MOMBASA 723647733
958 PHOENIX PROCUREMENT LIMITED NAIROBI 0205205873
959 ALFAS CROSS LOGISTICS LTD. NAIROBI 0722515913
960 FREMMY FREIGHT INT.l LOGISTIC LTD. MOMBASA
961 MACKENZIE MARITIME E.A. LTD. MOMBASA 041-2230183-5
962 ALL SCOPE LOGISTICS LTD. NAIROBI 0721809850
963 LINKFREIGHT E.A. LTD. MOMBASA 0722831454
964 JADE PRIME LOGISTICS (E.A.) LTD. MOMBASA 0722351520
965 HERBER LOGISTICS LTD. MOMBASA 0722336347
966 KAMANGA FREIGHT SERVICES LTD. MOMBASA 0721204235
967 HEROS CO. LTD. MOMBASA 0721725885
968 UTILITY FREIGHT LOGISTICS LTD. MOMBASA 0722784407
969 DANPA LOGISTICS LTD. NAIROBI 0720480877
970 MEGRIAN ENTERPRISES LTD. MOMBASA 0701675297
971 HARMIC EXPRESS KENYA LTD. MOMBASA 0722353536
972 INSTANT FREIGHT FORWARDERS NAIROBI 020-3380347
973 SEAWORLD SHIPPING AGENCIES LTD. NAIROBI 722160201

974 ISLAND EXPRESS SERVICES MOMBASA 0722632739
975 CARGO PLAN MOVERS & FORWARDERS LTD. NAIROBI 020-2495114
976 KIMM FREIGHTERS (K) LTD. MOMBASA 0722841042
977 TAMANYA FR. & LOGs SERVICES LTD. MOMBASA 0722521402
978 FERDINARD FR. & FORWARDERS LTD. NAIROBI
979 GALAHANJI CARCO SERVICES NAIROBI
980 WOLFENBERG INTERNATIONAL NAIROBI
981 TEPRA LOGISTICS LTD. NAIROBI
982 JAMREKS ENTERPRISES MOMBASA
983 MID AFRICA SERVICES LTD. NAIROBI
984 TRANSNET FREIGHT INTERNATIONAL NAIROBI
985 ARNOP LOGISTICS CO. LTD. MOMBASA
986 SPEAR LOGISTICS (K) LTD. MOMBASA
987 GIFTLINE FREIGHT SERVICES LTD. NAIROBI
988 FLOWERPORT LOGISTICS LTD. NAIROBI
989 KALEMU FREIGHTERS LTD. MOMBASA
990 FREIGHTNET LOGISTICS LTD. NAIROBI
991 PINNACO LOGISTICS LTD. NAIROBI
992 SUFIKE INVESTMENTS LTD. NAIROBI
993 ACTIVE FORWARDERS LTD. MOMBASA
994 ZAM ZAM C&F CO. LTD. SUNA
995 VESTERGUARD TRADING CO. LTD. NAIROBI
996 SMART TRADERS LTD. MOMBASA
997 SEACROSS FREIGHTERS E.A. LTD. MOMBASA
998 GREENBELT LOGISTICS LTD. MOMBASA
999 GEOMWA EXPRESS CARGO LTD. MOMBASA
1000 MUSTAFA MOHAMED ISSA LTD. MOMBASA
1001 DELTA HANDLING SERVICES NAIROBI
1002 VID FREIGHTERS LTD NAIROBI
1003 COASTAL FREIGHTERS E.A. LTD. MOMBASA
1004 BLUE OCEAN E.A. CO. LTD. MOMBASA
1005 AURUM MINERALS LTD. NAIROBI
1006 CASCADE SWIFT E.A. AGENCY LTD. MOMBASA
1007 APPLE LOGISTICS LTD. NAIROBI
1008 SAI CARGO MASTERS LTD. NAIROBI
1009 REMOVALS GOODS SERVICES LTD. NAIROBI
1010 BOLTSPEED CARGO FORWARDERS NAIROBI
1011 SYLLER IMPRESS CO. LTD. MOMBASA
1012 JUSS FREIGHTERS LTD. MOMBASA

1013 ALIMANN LOGISTICS LTD. MOMBASA
1014 HILLCONS ENTERPRISES CO. LTD. MOMBASA
1015 ALPINE TRADING LTD. MOMBASA
1016 ELDOM CARGO SERVICES NAIROBI
1017 ISSA CLEARING & FORWARDING CO. MOMBASA
1018 ALSHOG SYSTEMS LTD. MOMBASA
1019 INSPIRE AFRICA LOGISTICS MOMBASA
1020 AFRIQUE SHIPPING SERVICES LTD. NAIROBI
1021 EZY VENTURES LTD. NAIROBI
1022 ROLA FREIGHTERS CO. LTD NAIROBI
1023 KARICKO INVESTMENTS LTD. NAIROBI
1024 MAHEK LOGISTICS INT LTD. MOMBASA
1025 FREIGHTMAX CO. LTD NAIROBI
1026 RUSTIC DESIGNS LTD. NAIROBI
1027 KIM INVESTMENTS LTD. NAIROBI
1028 WATER FRONT ENTERPRISES LTD. NAIROBI
1029 EVERTRUST GLOBAL LOGISTICS LTD. NAIROBI
1030 STAREX FREIGHTERS LTD. NAIROBI
1031 DYNAMIC EXPRESS LTD NAIROBI
1032 MEDITERRANEO EXPRESS LTD. MOMBASA
1033 MUSTAFA FR. FORWARDERS LTD NAIROBI
1034 AVENFREIGHT LOGISTICS LTD. NAIROBI
1035 CHAMTECH LOGISTICS LTD. NAIROBI
1036 CHABS TRADE CONNECTIONS LTD. MOMBASA
1037 TRAWLERS LTD. MOMBASA
1038 JOBMA ENTERPRISES LTD. MOMBASA
1039 NEWLINE CARGO FREIGHTERS LTD. MOMBASA
1040 TRANSQUICK LTD. MOMBASA
1041 FEDERAL FREIGHT FORWARDERS LTD. NAIROBI
1042 INTER-TROPICAL LOGISTICS CO. LTD. MOMBASA
1043 NEW WIDE GARMENTS (K) EPZ LTD. ATHI RIVER
1044 DELTA CARGO CONNECTIONS 2011 NAIROBI
1045 MUCH MORE C&F NAIROBI
1046 SPERANZA INTERNATIONAL LTD. NAIROBI
1047 JAMUSA ENTERPRISES LTD. NAIROBI
1048 CARGOMAX FREIGHTERS LTD. MOMBASA
1049 KANZIZE LOGISTICS LTD. MOMBASA
1050 JAMES FINLAY MOMBASA LTD. MOMBASA
1051 OGAKA FREIGHT LOGISTICS MOMBASA

1052 REFRIGERATED MEDICAL DISTRIBUTION LOGISTICS NAIROBI

1053 WINES OF THE WORLD LTD. NAIROBI

1054 KITAKA ENTERPRISES LTD. MOMBASA

1055 HANDY AIRCARGO LTD. NAIROBI

1056 RICHENS LOGISTICS LTD NAIROBI

1057 JAGOMA LOGISTICS LTD. MOMBASA

1058 ORBIT EXPRESS LPG LTD. NAIROBI

1059 PHAHIM FREIGHT FORWARDERS LTD. MOMBASA

1060 OTOX MAWEZO LTD. MOMBASA

1061 CARGO MOVERS LTD. MOMBASA

Source: Kenya International Freight and Warehousing Association (KIFWA)

Appendix IV Secondary Data Sheet

Year	**Inventory Turnover Rate**	**Order Fulfillment Accuracy**	**Number of employees**
2019			
2020			
2021			
2022			
2023			

Appendix V NACOSTI Letter

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

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